TECHNOLOGY DEPT.

First Copy

Library

PUBLIC LIBRARY
APR 24 1930
DETROIT

A National Newspaper for Every Branch of the Industry

Automotive Daily News

CARS · SHOP EQUIPMENT · TRUCKS · AVIATION · PARTS · ACCESSORIES · TIRES

Vol. 10. No. 1191 — Entered as second-class matter Aug. 27, 1925, Post Office, N. Y., N. Y., Under Act of March 3, 1879. — NEW YORK, SATURDAY, APRIL 19, 1930 — 10 Cents. $12 Per Year

AUTOMOTIVE FACTORY EXPANSIONS CONTINUE

Four Pennsylvania Truck Owner Groups to Combine

PHILADELPHIA, April 18.—A proposal to consolidate four truck owners' associations in Pennsylvania as the nucleus of an actual state-wide organization with an ambitious future, looking toward the eventual participating in a national truck owners' association, was unanimously approved at the April get-together dinner meeting of the Pennsylvania Motor Truck Owners' Association.

Indorsement of the tentative plan was made in the presence of the association's guest and chief speaker, Edward F. Loomis, secretary of the motor truck committee of the National Automobile Chamber of Commerce, who, in line with the chamber's truck educational campaign, now in progress, assured the members of that body's aid in every possible way toward the development of this or any other state truck association.

The meeting, attended by 110 members and guests, was held on the night of April 16 at the Elks' Club, Broad and Vine Streets. W. H. Brearley of the Autocar Company and president of the association, is the originator of the present plan to make the truck organization state-wide through a merger, and for some time has sponsored the idea, having called thereto the attention of Mr. Loomis long prior to the meeting. The four organizations whose representatives expressed themselves in favor of the consolidation at a special meeting called by Mr. Brearley in Philadelphia last week are the Pennsylvania Motor Truck Association; Philadelphia; the Philadelphia Team and Truck Owners' Association, Philadelphia; the Delaware County Truck Owners'

(Continued on Page 2)

Dealer Tire Stocks Less Than in 1929

Washington, April 18. — Tire dealers throughout the country are carrying fewer tires on the average than they did a year ago.

On April 1 the average stock of automobile and truck casings per dealer was seventy-five, or nineteen less than on the same date a year ago and six less than on April 1, 1928.

This was disclosed today by the rubber division of the Department of Commerce on the basis of reports received from 22,332 dealers.

Dealers reporting stocks of high pressure casings were tabulated separately: 17,493 dealers reported 364,164 high-pressure casings in stock, or 20.8 per dealer; 20,045 dealers reported 459,001 high-pressure casings, or 22.9 per dealer on Octo-

(Continued on page 12)

ADDITIONAL comments by engineers and executives in the industry on factory and production methods and equipment, which were received too late for publication in this issue, will appear in subsequent issues of Automotive Daily News.

O'MARA AGAIN TO HEAD BROCKWAY MOTOR TRUCK

New York, April 18.—At the organization meeting of Brockway Motor Truck Corporation the following officers were elected: Martin A. O'Mara, president; J. D. Lannon, vice-president and general manager; C. M. Finney, vice-president and treasurer; J. Gossner, vice-president, and C. E. O'Neil, secretary and assistant treasurer.

Position of chairman of the board was left vacant and duties assumed by the president. The following executive committee was formed: C. K. Woodbridge, chairman; Martin A. O'Mara, J. D. Lannon and C. M. Finney.

DAY-ELDER TRUCK IS NOW EQUIPPED WITH CHROMIUM RADIATOR AND HEADLIGHTS

Irvington, N. J., April 18.—Effective immediately and with no increase in prices, the Day-Elder Model MF 1¼-tonner, built by the National Motors Manufacturing Company of this city, will be equipped with a chromium-plated radiator and headlamps.

This new radiator has been improved materially in appearance by the use of a chromium-plated filler cap which is of the latest sealing or quick-easy type.

Earlier this year chromium-plated hardware was placed in the driver cabs of the larger Day-Elder chassis. This progressive step is in line with the company's policy to make available to truck owners economies in design and engineering practice as soon as they prove practical.

The Day-Elder engineering department is constantly endeavoring to improve the quality and appearance of its product and the foregoing is just one of many steps taken to achieve this purpose.

ENGINE IN NEW STEWART TRUCK IS 3¼ BY 4½

New York, April 18.—Specifications of the Stewart Motor Corporation's new 1¼-ton truck, Model 16XA, appearing in Automotive Daily News, gave the size of the six-cylinder motor as 2⅞x4¾, when it should have been 3¼x4½, developing 61 horse power at 2,600 revolutions per minute.

ENGINEERS PREDICT HIGHER COMPRESSION, MORE POWER

NEW YORK, April 18.—Some vitally interesting engineering opinion has been received by the Automotive Daily News in answer to a questionnaire which was recently sent to the executives in charge of this phase of the activities of various leading manufacturers.

The questions asked will be obvious from the replies and concerned the possibilities of higher compressions; the likelihood of greater use of four-speed gear sets; as to whether cars are likely to be built even lower than they are today; whether there is a tendency to higher power and greater speed in our power plants; the likelihood of oil-cooling devices becoming popular and the probabilities of a great use of rubber on chassis.

The replies follow:

COMPRESSIONS WILL GO HIGHER

By H. T. WOOLSON,
Chief Engineer Chrysler

Your letter of April 7 opens up a number of questions rather difficult to answer definitely. In expressing our opinion, we would rather have it take as our opinion of the trend of the industry than any indication of the development by any one individual engineering department.

Compressions will probably go higher, depending somewhat upon the development of the cylinder head, and the limit will be partly controlled by the materials available for the cylinder head itself and the valves and other parts exposed to the heat of the gases.

Since high speeds are becoming more common, we believe that the four-speed transmission will gain ground because of the fact that it very greatly increases the flexibility of the automobile for every day use on all kinds of roads and conditions. It enables a more intelligent use of the car and motor and also makes for more comfortable driving at high speeds, due to the fact

(Continued on page 11)

VESTA CORP. CREATES DEALER PROFIT PLAN

Chicago, Ill, April 18.—Following a widespread analysis of the problems which confront every battery dealer under the present economic conditions, the Vesta Battery Corporation of this city, has announced a new policy for the dealer's benefit.

It has been established that the dealer's profit is of far more importance than the volume of business he does. It has been found that far too many dealers have been striving for volume and letting profits take care of themselves, resulting in small and unsatisfactory gains. Vesta has made a careful survey of this matter, and created an entirely new set-up in the Vesta line to enable the dealer to build his profit plan on a firm foundation. This consists of a line of batteries that is more simplified than heretofore. In other words "standardizing" as far as possible.

This means a smaller investment in stock for the dealer, with a quicker turn-over of money invested in stock, consequently multiplied profits. While this is ultimately volume, it, nevertheless, takes profit into consideration as being of first importance. Slow-moving types are eliminated. The better and medium quality lines are provided in both the standard size and oversize, enabling the dealer to sell a greater

(Continued on page 11)

MANUFACTURERS' CONFIDENCE IN QUICK REVIVAL OF BUSINESS REFLECTED IN NEW BUILDING

Industry Participates in 46% Increase in National Construction in March Over February, Survey Shows

NEW YORK, April 18.—Confidence in the immediate future of the automotive industry is revealed in the large plant expansion program now being launched by many motor vehicle, accessory and equipment manufacturers. These programs will go a long way toward relieving the unemployment situation and reviving business generally.

The activity in the automotive centers is reflected in the national monthly building survey of S. W. Straus & Co., which states that building construction throughout the United States took a definite turn for the better in the past month. Building permits in March showed a gain of 46 per cent. over February, totaling $187,270,891 in 583 representative cities, as against $128,043,217 in February.

The significance of the March gain over February lies in the fact that the normal expected increase is only about 37 per cent. These reports, according to Straus, constitute the most reassuring indication so far received that the building trend has turned the corner, and is headed upward.

From such centers as Toledo, Chicago and Philadelphia come reports of much new building, either by or for the automotive industry, these

(Continued on Page 12)

Auburn Sales For Quarter Set Record

Auburn, Ind., April 18.—The weather, thermometer of most business, has a decided effect on autmobile sales. When it is balmy or the sun shines brightly the public buys cars; when it is cold and gloomy sales drop.

"Weather conditions for the first three months of 1930 have been decidedly unfavorable to the sale of motor cars," acording to N. E. McDarby, director of sales for Auburn. "The industry as a whole has suffered from this, but with April opening up fair a decided increase in automobile sales generally is already in evidence."

As there is always an exception to all rules, Auburn has been the exception in the automotive industry this year and showed the greatest sale of cars in the first three months of 1930 in its history, McDarby pointed out.

The Auburn official, who has just completed a trip covering fourteen states, said that the used car situation is still a problem for dealers generally, but that there is a decided tendency of automobile men to trade more carefully than heretofore.

The general opinion of dealers, McDarby said, was that the public was buying more closely this year, giving more attention to values offered in the new car, and if it meets their requirements for transportation.

REEVES TO GIVE SERIES OF TALKS ON INDUSTRY

New York, April 18—Alfred Reeves, general manager of the National Automobile Chamber of Commerce, left for Washington today, where he will be the guest speaker at 8 o'clock tomorrow night over the WEAF radio chain, with a coast-to-coast hookup.

Next Wednesday Mr. Reeves will speak at Cleveland before the National Petroleum Association on "Dividends That Come From Co-operation in the Motor Industry."

The following evening at Miami Hotel in Dayton, O., he will speak before the motor car dealers on the "Automotive Outlook" and hold a clinic covering points about the industry with which dealers are confronted by their customers.

Special Production and Factory

features, reviewing developments during the past year and indicating trends for the future will be found throughout this issue as follows:—

Planing Alloy Heat-Treated Steel ..... Page 4
Remington Rand Offers Car Makers Library ..... Page 6
Editorial: Factory Equipment ..... Page 6
Building Crowned Fenders at Low Cost ..... Page 8
Precision Grinding Advances ..... Page 8
Stamping Machines Combine Operations ..... Page 8
New Method of Engine Cleaning ..... Page 11
Recent Developments in Special Welding ..... Page 14
Multiple Boring Machines Speed Work ..... Page 15
Conveyor Systems and Their Applications ..... Page 18
Diamond Tools Prove Successful ..... Page 18
Improvements in Steel Cutting Tools ..... Page 18
FINANCIAL NEWS
Range of Automotive Stocks ..... Page 16
Motor Shares Off Slightly in Irregular Week ..... Page 10

FOUR PENNSYLVANIA TRUCK GROUPS PLAN TO JOIN IN MERGER

(Continued from Page 1)

Association, Delaware county, Pennsylvania, and the Allegheny County Team and Truck Owners' Association, Pittsburgh. Wednesday night's meeting at the Elks' Club was the first time that the proposition had been brought before the membership as a whole.

Beginning with these four associations, it is intended to weld together a state truck association, statewide, in fact, as in name, which the Pennsylvania Motor Truck Owners' Association makes no claim of being, as at present constituted. The tentative program includes establishing a headquarters office in Harrisburg, the capital; another office in Philadelphia and prooably still another in Pittsburgh. Local or county associations throughout Pennsylvania will be invited to join.

Following aporoval of the plan, as far as developed, at the Elks' Club meeting, a committee was appointed by the Pennsylvania Motor Truck Owners' Association to meet with similar committees to be named by the other three organizations, all to report back to their respective associations after having formulated a definite plan for approval. President Brearley and J. G. Moxey, the latter of the Atlantic Refining Company, were delegated to represent the Pennsylvania Motor Truck Owners' Association to make the final draft of the plan, which has a bearing on the oft-discussed question of the best way eventually to form a national truck owners' association—the ultimate hope.

President Brearley, Mr. Loomis, Mr. Moxey and Buell G. Miller, a past-president of the association, present chairman of its legislative committee and head of the Miller North Broad Storage Company, spoke in favor of the consolidation and in various ways outlined the benefits from such a step.

There are now included in the Pennsylvania Motor Truck Owners' Association two divisions, owner-operator and trade, and five groups —storage, truck sales, tires, interstate hauling and general hauling. Each of the groups has its own problems, all of which are not identical, or of equal interest to the full membership. The thought of the sponsors of the new plan was that with a statewide organization, with its big membership roll, its greatly increased funds and its vastly augmented influence for the interests of all divisions, real service of a nature more far-reaching than that of any individual association, or small group thereof, could be given to the members, answering that oft-recurring question, "What does the member get for his dues?"

By organizing a statewide association the members could obtain a practical interest in legislation affecting the industry; matters coming before the Public Service Commission; matters pertaining to regulation by the Interstate Chamber of Commerce; good roads, fees, uniform reciprocity between all states, instead of between only ten, as at present, and many other matters of importance.

More effectiveness, weight and influence in the right direction, it is contended, could be brought to bear with such an organization, in addition to greatly reducing overhead for the various associations making up the whole. It is maintained that the business interests of the trade division, as well as of the owner - operator division, would therewith be promoted. A little experimental work already has been done in New Jersey along somewhat similar lines, or leading thereto, and is now in course of progress in Connecticut, where the Motor Truck Association of Connecticut only recently was organized, with headquarters in Hartford.

There are some 300 members in the Pennsylvania Motor Truck Owners' Association, which is represented by about 5,000 trucks, and it is said the merger would bring together in the nucleus approximately 750 individual members, represented by a vast horde of trucks.

The assistance promised by Mr. Loomis would include the distribution through Pennsylvania of a quantity of helpful literature bearing the name of the State Truck Association, and there would be at least one or two field men, with Mr. Loomis, himself, to interest men in business and industry in truck transportation.

CAR BUYERS DEMANDING BRIGHT COLORS THIS YEAR

Detroit, April 18.—The demand of buyers of fine cars for bright colors and a wide variety of color combinations is greater this year than it has ever been before, according to officials of the Lincoln Motor Company. This is particularly trfue, they say, in the open and convertible types.

CLASSIFIED ADVERTISEMENTS IN THE AUTOMOTIVE DAILY NEWS BRING RESULTS

SPARKS from DETROIT

Chrysler Men Meet

* * *

Gambill Repeats Hupmobile Driveaway

* * *

Sunday Closing

Fred Kingsbury—Detroit Editor

THE Highland Park plant of the Chrysler Corporation was a very busy place the other day, as that is where the annual meeting of the stockholders was held. The Chrysler Corporation has Highland Park all to itself since Ford moved his organization to River Rouge and Dearborn. Highland Park is a city within the city of Detroit and is a very prosperous community.

* * *

S. L. Davis, retail sales manager of the Gambill Motor Company of Chicago, was in Detroit the other day en route to Cleveland with a large number of Chicagoans who had purchased Hupmobiles. He staged a driveaway of Hupmobiles, made in the Cleveland plants of the company. This driveaway came on the anniversary of the big driveaway held by the same organization from Detroit a year ago.

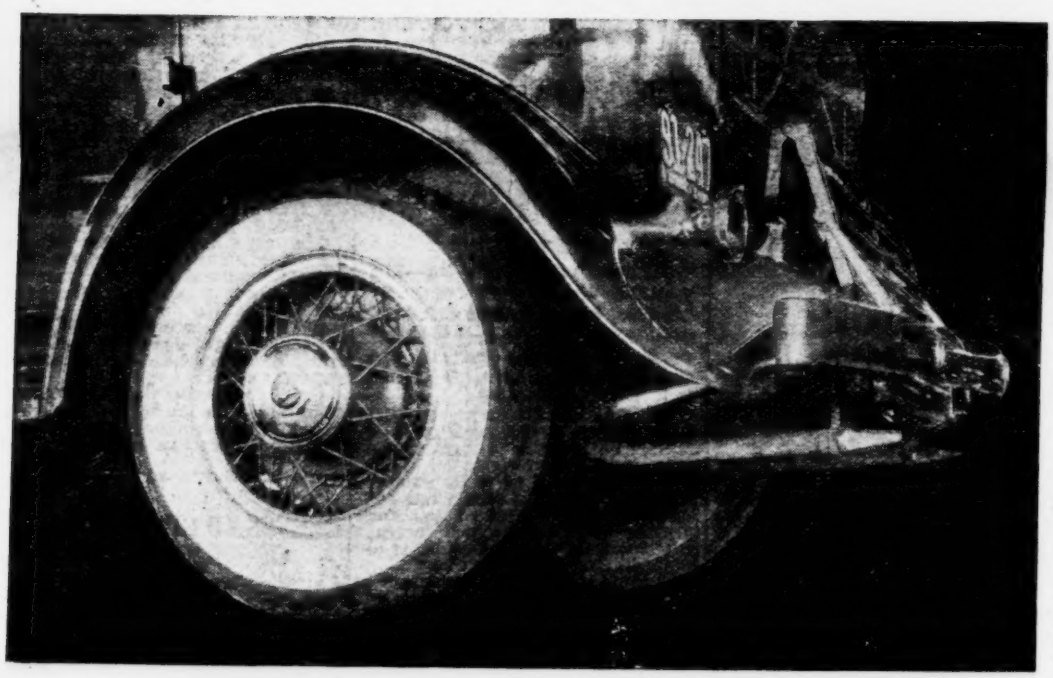
* * *

GROVER C. DILLMAN, highway commissioner, is advocating a new highway in the state that will enable motorists from the south to drive around Detroit without having to go through the city. It seems likely that a trunk line will be built in the near future.

* * *

SUNDAY closings are being discussed by automobile dealers in many cities this year, according to reports coming to Detroit. This question has never been definitely settled by all but has been tried out in a great many municipalities. However, salesrooms in the majority of cities are open Sundays.

NEW DEPARTURE BALL BEARINGS



CADILLAC 16-cylinder

represents the supreme achievement of an organization with unlimited resources and technical skill. Eighteen New Departure Ball Bearings were designed into the chassis.

Price or prejudice had no place at the council table when this magnificent automobile was born. . . .

The New Departure Mfg. Co. Bristol, Conn.

NOTHING ROLLS LIKE A BALL

"YOU have unquestionably done the right thing in putting a low price on the Whippet. It will not only stimulate Whippet sales, but will help the entire Willys-Overland line. Our sales have already increased materially."

—Auto Sales Co.
Wheeling, W. Va.

Write or wire for franchise details

WILLYS-OVERLAND, Inc.
TOLEDO, OHIO

WILLYS-OVERLAND SALES CO., LTD., TORONTO, CAN.

FIVE POINT BALANCE

CARBON RESIDUE
POUR POINT
VISCOSITY
FLASH
FIRE

A DISTINCTIVE FEATURE OF THE *NEW*

KOOLMOTOR OIL

FOR perfect performance and absolute protection to moving parts, modern motors demand a perfect balance of the five qualities of a motor oil. There must be the perfect elation to each other of the five tests of oil quality—viscosity, fire, flash, pour point and carbon residue.

Koolmotor Oil possesses this distinctive 5 Point Balance.

When Cities Service experts built 5 Point Balance into the new Koolmotor, they removed the shortcomings in motor oil. They perfected an oil that retained the benefit of each quality without sacrifice of any other. Mile by mile, day by day, the new Koolmotor Oil gives balanced performance.

The buyers of the car you sell will receive every benefit you promised them if you will recommend the exclusive use of this perfectly balanced motor oil—the new Koolmotor Oil—and satisfied customers are your best assurance of continued patronage when the new car question comes up again.

The *perfect* Pennsylvania Motor Oil

CITIES SERVICE OILS

ONCE - ALWAYS

ADVERTISING AND NEWS DEPARTMENT
Cities Service Company, 60 Wall Street, New York City
Gentlemen: Please send me a copy of your pamphlet, Whatever the Road—Whatever the Climate (Koolmotor Oil).
(Name) .....
(Address) .....
(City) ..... (State) .....
P. S. I would appreciate ..... extra copies for distribution to my customers.

CITIES SERVICE OIL COMPANY

60 Wall Street, New York

Cities Service Oils & Gasolene

Cincinnati Planer Builds Extra Heavy Machine for Alloy Heat-Treated Steel

By CARL LINDEN
The Cincinnati Plane Co.,
Cincinnati, O.

IT was found necessary when machining dies that an extra heavy machine is necessary, capable of taking cuts in the high carbon alloy heat treated steel. The photograph shows the tangs on die blocks being machined. This material has a scleroscope hardness varying from 45 to 60 and it is necessary to machine this tang with the quickest possible speed. This is machined out of the solid. The manufacturers have tried to remove the full depth at one pass. This depth varies around 2 inches. By taking the smallest amount of feed, which is around 1-64 inch and 2 inches in depth, it was found that the tools would not stand up under this pressure. It is therefore more advisable to remove this metal in two or three cuts.

After having all of this stock removed it is necessary to swivel the head to obtain the angle on the tang. This can be done with a wide swiping tool.

It is posible now with the heavy duty planers built to plane a block as shown in the photograph in about three-quarters of an hour. This is just one of the many jobs that are in the automobile die shops that require these extra-heavy planers equipped with devices so as to enable them to change from one job to another quickly.

A special planer equipped to plane press frames applies indirectly to the automotive trade due to the fact that they are using presses of all descriptions, and to enable them to buy them at a lower price, special equipment has been offered to machine these castings. With the setting they will only have to make the measurements once, which will save considerable time. All of the frames will be exactly the same when taken off the planer. Special slides have been embodied in this machine, and the planer has also been arranged so that the operator can handle the machine from either side.

One of our planers, equipped with the Keller mechanical and engraving attachment, can be used for machining dies of the irregular shapes. This machine is completely electrically controlled and the cabinet in the front side of the photograph is used for controlling the profiling attachment to the head. A metal template can be bolted to the plate on top of the rail and the electric tracer will follow this template reproducing this shape on the work. The complete gear box and mechanical control is placed on either end of the rail which is actuated by the electric contact which is made by the tracer. This movement controls the cross and down feed to the standard planer head. With this kind of device, any shape whatsoever can be machined, saving the time of planing it out by hand.

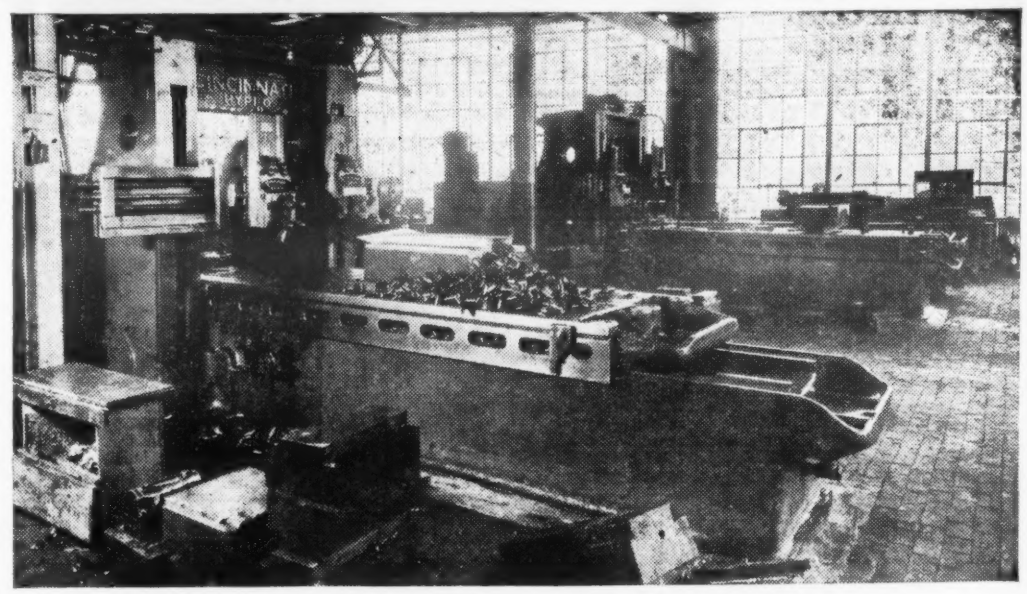
By removing the tracer, the planer can be used as a regular standard planer. This eliminates the single purpose feature to this machine and makes it a tool which can be universally used in a die shop or tool room. All the features which are embodied in the Cincinnati Hypro Planer are on this machine.

A crank planer which is used for tool rooms eliminates the overhang which is customary on a large 36-inch shaper and also provides a feature which cannot be obtained on a small planer. By having a column on the right hand side the operator can see just what he is doing.

Six speeds are supplied to the table so that steel or cast iron can be machined at the proper speed. This tool has found its way into quite a few automobile tool rooms for machining jigs and fixtures.

PREST-O-LITE CORP. ADDS NIGHT SHIFT AT FOUNDRY

Indianapolis, Ind., April 18.—Due to increased business, the Prest-o-Lite Storage Battery Corporation has added a night shift at the foundry here.



TONGS on die blocks being machined on Cincinnati planer

Barber-Colman Reamers Are Constantly Developed

By A. B. BRAND
Barber-Colman Company
Rockford, Ill.

BARBER-COLMAN Reamers and the Reamer Sharpener are the component parts of a syster of "hole size control" which is enjoying some popularity among progressive automobile manufacturers and others in the metal working industries.

The system involves the use of reamers which have been designed with an especially strong and solid blade mounting, an individual angle and arrangement of the blades, and such special details of design as may be required by the particular work to be done; these reamers being arranged to work in step with the Barber-Colman Reamer Sharpener, on which they are to be reground and brought to size when dull.

Since the introduction of these reamers a few years ago, they have been under constant development and improvement, until now a complete line of conventional types is offered.

The styles which are of most use to automobile manufacturers are the inserted-tooth cylinder reamers, line reamers of various sorts and fluted piston pin reamers. The cylinder reamers especially have been doing very good work in the plants where they have been adopted, as by their use it is possible to ream cylinder blocks either by the multiple reaming or single reaming process, to limits of .0005 inch for straightness, .0005 inch for out of round and .0005 inch for diameter. In many cases Barber-Colman reamers are made for and can hold the work to closer limits than these.

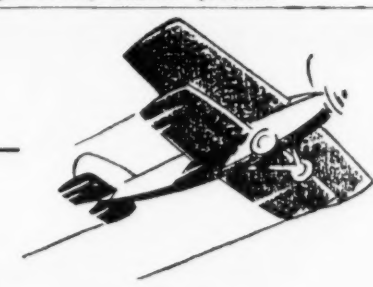
The reamers not only give a very accurate hole, but their resharpening is so closely controlled that the same limits can be held as consistently on a resharpened reamer as on a new one. This uniformity is made possible by the Barber-Colman reamer sharpener, which mechanically controls the regrinding process in such a manner that the diameter, nose form, clearance and land of the reamer are held closely to form and dimensions and may be duplicated at any time by a proper setting of the machine.

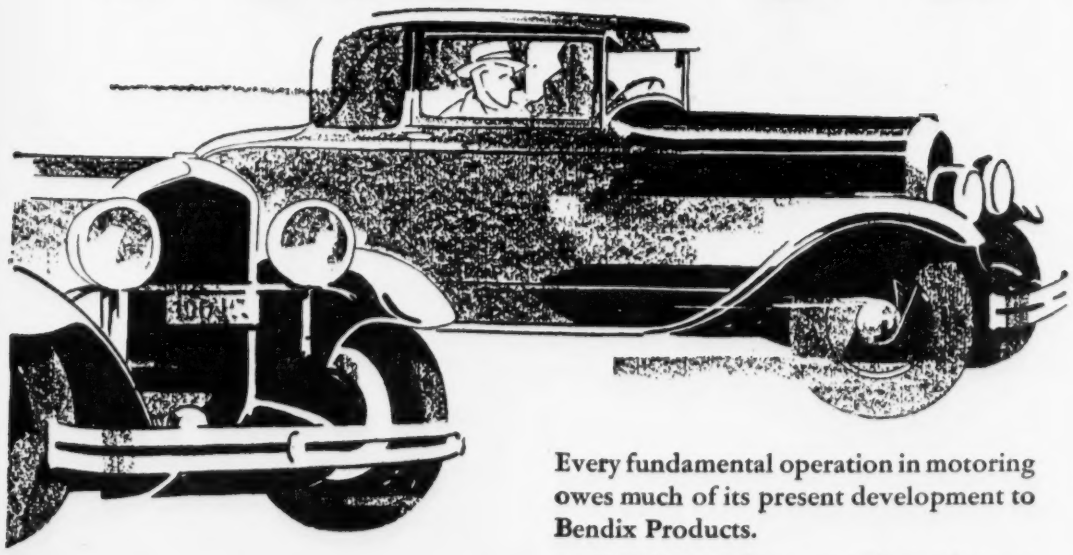
Another characteristic of Barber-Colman reamers is the fact that they generally are able to produce more pieces between grinds of the reamer than a hand-sharpened and hand-stoned reamer—this because of the uniformity with which the blades are sharpened on the reamer sharpener. Every blade cuts alike and no one blade, sticking out further than the rest, takes all the load.

Barber-Colman reamers and the reamer sharpener are modern tools for modern industry, and will be found useful in any manufacturing plant where there is a "hole size control" problem.

BENDIX PRODUCTS

AUTOMOBILE *and* AVIATION





Every fundamental operation in motoring owes much of its present development to Bendix Products.

Starting—going—stopping, wherever gasoline is used as power for transportation, there you will find Bendix Products at the very heart of each vital unit.

BENDIX AVIATION CORPORATION
New York · Chicago

BENDIX SUBSIDIARIES

AUTOMOBILE DIVISION

Bendix Brake Company, South Bend, Ind.
Brakes for Motor Vehicles

Bendix-Cowdrey Brake Tester, Inc., South Bend, Ind.
Automotive Brake Service Equipment

Bendix Service Corporation, Chicago, Ill.
National Service for Bendix Products

Bendix-Westinghouse Automotive Air Brake Co., Pittsburgh, Pa.
Air Brakes for Motor Vehicles

Bragg-Kliesrath Corporation, Long Island City, N. Y.
Vacuum Booster Brakes

Eclipse Machine Company, Elmira, N. Y.
Bendix Starter Drive

International Gernandt Motors, Ltd., South Bend, Ind.
Automotive Diesel Engines

Stromberg Motor Devices Company, Chicago, Ill.
Automotive Carburetors

Stromberg Research Corporation, Chicago, Ill.
Automotive Development

FOREIGN SUBSIDIARIES

Bendix Brakes, Ltd., Toronto, Canada
Eclipse Machine Company, Ltd., Walkerville, Canada
Bendix-Perrot Brakes, Ltd., Birmingham, England
Stromberg Motor Devices, Ltd., London, England

Copper Plays an Important Role in Automotive Industry

By NORMAN A. SCHUELE
Revere Copper and Brass, Inc., New York City

FOR some years past, the automobile industry has been using upwards of 250,000,000 pounds of copper per year in the production of motor cars. Obviously, this poundage implies that copper and its alloys, brass and bronze, play important roles both in the construction and the functioning of automobiles.

The car owner, office bound, who rushes into his garage, climbs into the front seat and pushes the starter button of his car expects something to get busy. It does. The whir of the starter and the muffled roar from the exhaust indicate that the battery has made a sleeping engine wake up.

Probably few people to whom this energizing is a familiar daily occurrence realize that copper has a lot to do with getting a motor "busy" and keeping it "busy." The energy of the electric battery transmitted over copper wires to the starter and to the spark plugs was essential to spin the motor and keep it spinning. Without the copper wiring the car owner would wait in vain for "something to get busy" when he pushed the starter button.

Every motorist knows the whereabouts of his gas tank . . . knows that he must have fuel in it if he expects his motor to work. The manner in which the fuel is supplied to the motor from tank, being less obvious, is not so well known. Concealed piping accomplishes this transfer and the piping is copper. This metal is not corroded either by the gasoline flowing through it or the mud and water barrage that beats against it from wet highways. Millions of pounds of copper are used annually for this piping.

A car may require anywhere from five to fifteen feet of this copper feed line. With 25,000,000 cars in service, as indicated by license figures, and reckoning only eight feet of copper feed line per car, it is quite a simple matter to compute that gas on its way from tanks to carburetors travels 40,000 miles in copper tubing within the cars.

Copper tubing is also used for oil distribution lines in crank cases. Cylinder head gaskets and smaller gaskets used in other connections are copper sheathed. The best constructed water pumps have bronze or brass impellers, shafts, glands and stuffing nuts. Brass or bronze parts are found in oil pumps.

Bronze or bronze backed bearings are largely used in motor construction and bronze is employed too for bushings. Carburetors are constructed of bronze or brass. Gas filters and and screens are of brass or copper. The cooling system is most efficient when the radiator core is brass or copper.

Brass is a favored material for headlights and is usually nickel-plated. Copper or brass reflectors take a high silver finish and retain it in long service. These bright reflectors assure efficient illumination of the road in night driving.

Hub caps on fine cars are usually of brass, nickel plated. Drain and pet cocks, grease cups and many other small but essential parts of the car ensemble are brass.

Without discounting the merits of other materials, it may be stated that copper, brass and bronze are particularly appropriate metals for the service expected of metals in automobile construction. Rain, snow, mud and similar deteriorating factors disfigure, weaken or destroy metals which rust.

Summer rains can beat against copper radiator cores, water can deluge brass headlights and mud and slush can bombard copper feed lines year after year without affecting their efficiency. Copper, brass and bronze are rust-proof.

PUBLIC SERVICE CO. TO OPEN INTERSTATE BUS TERMINAL IN PHILA., PA.

Newark, N. J., April 18.—An interstate bus terminal will be opened by Public Service Interstate Transportation Company at the southeast corner of 13th and Arch Streets, Philadelphia, about May 1, according to an announcement made from the company's headquarters here.

The entire first floor of the old Bell Telephone Company building has been leased by Public Service for a term of years and the necessary renovation and changes are being rushed in an effort to open the terminal as soon as possible. More than $5,000 is being spent in renovating the floor for terminal use, according to officials. All buses to Philadelphia will stop at the terminal. The structure has a frontage of 60 feet on Arch Street and 130 feet on 13th Street. Loading platforms will be set up along the curb.

Leasing of the buildings is in line with police parking policy in Philadelphia. Authorities there have long urged the bus lines to lease terminals and declared they would allow them parking space in front of the terminals. Fifty-three Public Service, Schultz Management and Pennjersey buses will use the terminal with an average of between 200 and 300 buses a day making stops there.

FORD APPOINTS HENDERSON

Portland, Ore., April 18 (UTPS).—Lester T. Henderson, assistant manager of the Ford branch here, has been appointed manager of the Ford assembly plant and branch in Milwaukee, Wis. Mr. Henderson has been a resident of this city for the past seven years and has served as assistant manager in Portland under three different managers. He joined Ford on January 2, 1912, as a mechanic and brass polisher.

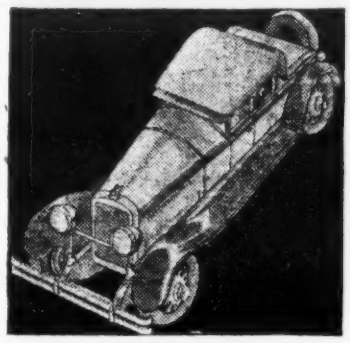
Briggs & Stratton Developing Their Metal Spring Cover Product

Milwaukee, Wis., April 18.—President S. F. Briggs of Briggs & Stratton, one of the largest manufacturers of automobile locks, reports that the new I. X. L. metal spring covers, patent rights for which were recently acquired through the recent acquisition of the I. X. L. Metal Spring Cover Company, is fast becoming one of the leading lines for Briggs & Stratton.

Mr. Briggs reports that automobile manufacturers are displaying increased interest in this new product, and increasing business is expected from this source in the near future.

The I. X. L. metal spring cover is designed to replace the present fabric covers for springs. It is an accessory which retains the original lubrication for the life of the car, preventing the entrance of dirt and water. It is of one-piece construction, easily installed in the line of production or by garage men.

Edward J. Forbes, formerly sales manager of McKinnon Dash Company, General Motors subsidiary manufacturing fabric spring covers, is in charge of sales of the new product for Briggs & Stratton.



HAVE WE OVERRATED

♦

THE STAMINA OF SPRINGS?

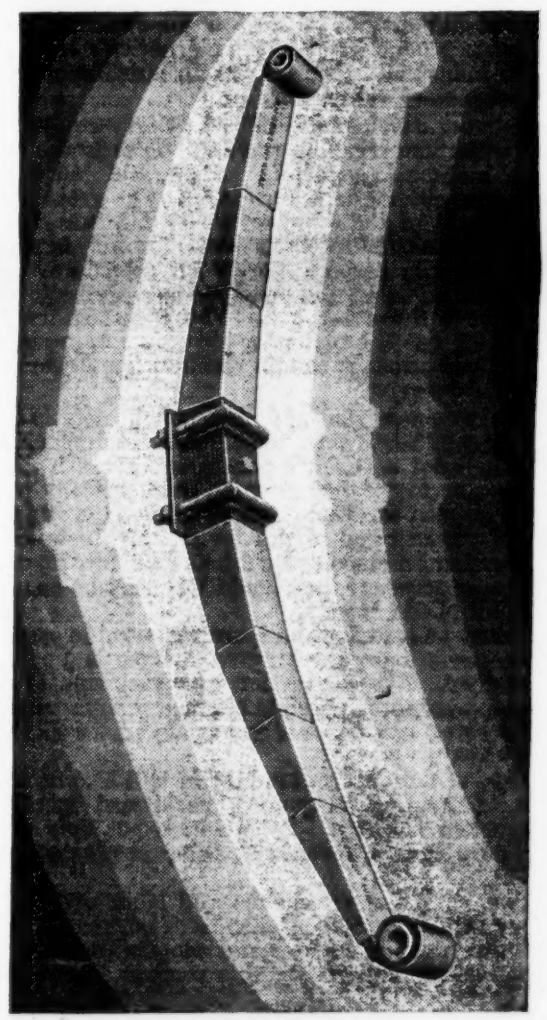
Tests prove that spring oscillations are increased 60% by water lubrication and decreased 40% by corrosion. That is why the average car goes to the service station for spring trouble twice as often as for other causes.

There is nothing the matter with springs themselves. They merely need protection . . . constant protection. And here it is . . . sturdy, snug-fitting armor . . . Anderson-Ajax Steel Spring-Covers.

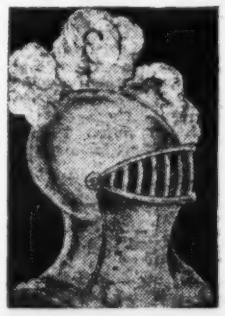
These steel jackets protect the springs from water and corrosion . . . They seal in lifetime lubrication.

Many 1930 cars are factory equipped with Anderson-Ajax protection. Bring your car up to the new riding comfort standards of Nash twin-ignition 8, Nash twin-ignition 6, Peerless, and Cadillac V-16 . . . Anderson Manufacturing Company, 155 Sidney St., Cambridge, Massachusetts.

Distributed to automobile manufacturers from the factory, Cambridge, Mass. Detroit office, Mr. George H. Hunt, 2-244 General Motors Building. Sold and serviced to the wholesale and retail trade by three thousand Gabriel distributors the world over.



ANDERSON-*Ajax*

Steel  SPRING COVERS

Fully Protected By Patents

Automotive Daily News

"Of, By and For the Entire Automotive Industry"

Published Every Day Except Sunday and Monday by
AUTOMOTIVE DAILY NEWS PUBLISHING CORPORATION,
350 Hudson St., New York, N. Y.
O. J. Elder, President. H. A. Tarantous, Vice-President. Alexander Johnston, Secretary.

Entered as second-class matter August 27, 1925, at the post office at New York, N. Y., under the Act of March 3, 1879.

Circulation—Net paid Average over 10,000 daily guaranteed. Member A. B. C.

SATURDAY, APRIL 19, 1930

ADVERTISING AND BUSINESS HEADQUARTERS

2716 Graybar Bldg., New York, N. Y. Telephone LEX ington 6383
Harry A. Tarantous, Business Manager. J. Edward Schipper, Eastern Manager. George M. Slocum, Manager Detroit Bureau, 427-8 Fisher Building, Detroit, Mich., phone Empire 3500; Willard R. Cotton, Western Manager, 333 North Michigan Ave., Chicago, Ill., phone Central 5936; Metz B. Hayes, New England Manager, Little Building, Boston, Mass.; Blanchard, Nichols & Coleman, American National Bank Building, San Francisco, Cal.; Lincoln Building, Los Angeles, Cal.; 1037 Henry Building, Seattle, Wash. Address ALL advertising and business correspondence to 2716 Graybar Building, New York City.

EDITORIAL DEPARTMENT

350 Hudson St., New York, N. Y. Telephone CAN al 1000
Alexander Jonnston, Editor. William C. Callahan, News Editor.
Detroit Bureau—Fred Kingsbury, Editor, 427-8 Fisher Building, Detroit, Mich., phone Empire 3500. Contributing Editor, John C. Wetmore.

Mail subscriptions to CIRCULATION DEPARTMENT—C. H. Wilson, Manager.
1926 Broadway, New York, N. Y. Telephone TRA falgar 4500
Subscription Rates—One year, $12.00; two years, $20.00, for United States and Canada. To Foreign Countries—One year, $15.00; two years, $26.00. Single copies, 10 cents.

Factory Equipment

THIS issue of the Automotive Daily News is devoted primarily to the interests of factory equipment. In analyzing the almost miraculous development of the automotive industry, the student of such matters comes inevitably to the conclusion that to the manufacturers of factory equipment must go a tremendous share of the credit for the industrial evolution that has taken place.

Beneath all the production and distribution development of our industry lies a foundation of machinery and equipment that has reached a stage of perfection that has aroused the astonishment and envy of the rest of the manufacturing world. The mass production, which is America's essential contribution to industrial science, is made possible only by our magnificent factory equipment.

In studying the development of the factory equipment industry, one noticeable trend stands out. That is the perfection of the automatic principle. More and more are machines becoming automatic in operation. The great mass production machines of today make it possible for even a green operator to turn out first-class work. In fact, in many cases the operator has become merely an attendant. He loads the raw materials in the machine and extracts the finished product at the other end. The accuracy that is achieved by these great automatics of today is nothing short of startling. Their product equals the best hand-work of the era which has departed.

Another development that any student will note is that of what we may call "multiwork" machines. Such machines will not only turn out a finished job in one operation, but will handle three or four types of work, automatically passing it along from one operation to another until the finished job rolls out of the exit end of the device. An instance in point is the reaming and boring machines that now turn out work with greater accuracy than could formerly be done by hand and at multiplied expense.

A word must be said for the truly remarkable systems that have been devised for carrying work from one part of a plant to another. The production line backbone of our mass production system is possible because the most ingenious ways of feeding in parts and materials where they are needed is now available.

The student of automotive production will also note the growing use of welding in joining parts and materials formerly riveted or soldered. By welding, not only speed is achieved, but weight is reduced at many strategic points in construction.

It is not only in the great time and labor-saving machines that our factory equipment men have worked a revolution. A definite trend in factory and shop is found in the constantly increasing use of portable electric tools in the factory, and in shops too, for that matter. New applications for portable tools have speeded up many of the operations in automotive industrial plants.

It would be idle to comment on developments in factory equipment without glancing at the progress which has been made in the evolution of new metals. One particularly interesting field in this development is that of rustproof metals. The recent progress in this line more or less began with the introduction of chromium plating. Now we have metals that are solidly rustproof, through their whole structure, so that wearing off is impossible. Strides are constantly being made in the production of new alloys, which are better adapted for specific tasks in automotive production.

Metals stamping is also making remarkable strides,

Metal stamping is also making remarkable strides, tion. New lubricants for machinery are being developed.

All honor, then, to the manufacturers of shop and factory equipment, who are standing behind our industry in its march forward to new efficiency and even more wonderful achievement.

Remington-Rand Designs Library As New Service to Car Makers

By JOSEPH HARRINGTON

A NEW service, designed to save vast sums for automobile manufacturers and firms in kindred lines, has been put into operation by the Remington-Rand Business Service, Inc., 205 East 42d St.

It is called the business library division and its direct purpose is to assemble for firms all the data of scientific and commercial nature concerning the product in which that firm specializes.

The service classifies, catalogues and indexes the data so that they may be easily accessible to all employees of the firm. When completed, each library contains virtually every bit of authoritative information pertaining to the merchandise handled by the firm.

The value of such a library—in fact, the necessity for it—is readily apparent. The shining new automobile which rolls off the assembly line today represents not one field of specialization but a thousand or more specializations.

The radiator is today a highly specialized article; years of scientific work have been spent on various kinds of shackle bolts; the modern clutch, the spring, the upholstery are all articles of individual specialization.

The automobile represents the product of not one science, but of a great number of sciences. The automobile manufacturer, naturally, wants every part of his car to be perfect. He spends huge sums for engineers and designers, men whose heads are crammed with automotive knowledge.

Yet he cannot hope to assemble a group of engineers which will possess all the knowledge in existence about automobiles or accessories. To fill this requirement, to give each manufacturer the benefit of all that science has found out about automobiles, all that surveys have shown about marketing automobiles, the Business Library Division was founded.

To assemble every known fact about each part of an automobile would seem like a gigantic task. But, according to Miss Ruth Howard, director of the Business Library, it may be done efficiently and at a cost comparatively small, considering the potential saving.

"Every discovery that is made, the result of every experiment, is put in print, usually within three months after it is made," she said, "sometimes in pamphlet form and sometimes in book form."

Experimentation, particularly with automotive devices, is a notably expensive proceeding. It takes the skill and time of highly paid engineers. Even with experimentation, an inferior product has frequently been put on the market, to fail in the final test—that is, fail to meet the expectations of the user. The result is to injure the reputation of the manufacturer and the retailer.

The very apt question, put to manufacturers by the Business Library, is: "Do you know all there is to be known about your business?"

Only the stubborn, blinded business man will answer yes. In France, engineers may have learned a vital fact about the use of a certain steel, a fact which will result in a better product at a saving in the cost of manufacture. How is the American manufacturer of the same line to know about it and take advantage of it? There are only two ways. One is to scatter agents in all parts of the world where research is made. This would obviously cost more than the results are worth. The other way is to get a business library.

The good business library would not stop at assembling all the known facts. It would look to the future by subscribing to journals which report new discoveries and advanced methods. It would have a library to catalogue every innovation.

The manufacturer wishing to improve, for instance, his valve would order his librarian to bring him all the data on this. Tons of information have been printed about valves. Thousands of expensive experiments have been made with them, some turning out to be a waste of time, others fruitful.

It is only the inefficient manufacturer who will summon his engineers and tell them to start designing a new valve. They might spend weeks, months, even years in covering the ground, performing experiments which have been done before and the authoritative results published. If experimentation is desirable, it should start where all others have left off.

Another problem frequently confronts the automobile manufacturer: He desires to expand his export business and has his eyes on a certain country. Should he send high-paid men abroad to study conditions in that country to see whether it is a feasible plan to establish an agency there? That would be quite unnecessary with a business library. The manufacturer should call for the data on that country as concern the automobile industry there. In a matter of minutes, if his library is well managed, he should know just what conditions exist in that country; whether the people favor American-made cars; what the average income (most important!) of the citizenry is; what is the tariff on cars; does the government encourage or discourage the advent of American business, and anything else he wants to know.

Practically every firm has what may be called a library. It may consist, however, only of a few old volumes and pamphlets, lacking in up-to-date information, its information inaccessible because no index has been installed.

The Business Library Division takes hold of the old library, catalogues whatever information is in it, and then combs the world for data to fill up the gaps.

More and more the idea of starting, not at the beginning, but where others have left off, taking advantage of information gathered at great expense by others, is gaining favor with the American business man. Miss Howard pointed out that in 1918 there were 1,500 business books in print. In 1928 a survey showed 4,000 in print. These figures, of course, do not include the pamphlets and booklets.

The business library is not merely for the manufacturer of motor cars, whose field embraces so great a number of angles. It is for the manufacture of accessories, for the jobber, for the sales agency, for every firm whose business touches the industry. The library should contain market reports, competitive prices—in fact, it should contain the answer to every question which enters the head of the business man, the designer, the engineer or the mechanic.

PIERCE-ARROW EXHIBITS CAR FOR PERSIAN SHAH

New York, April 18.—The Pierce-Arrow Motor Car Company is exhibiting in its showrooms at Broadway and 57th Street a jeweled white and gold motor car designed by the organization for Riza Khan, Shah of Persia, who will drive in it through the streets of Teheran on ceremonial parades.

LOCKE CO. HEAD DIES

Victor, N. Y., April 18.—Fred M. Locke, head of the Locke Insulator Company, and inventor of the Locke insulator, died at his home here following a short illness, at the age of 69 years.

COMING EVENTS

APRIL

12-27—**Milan, Italy.** Italian International Automobile Show.
24-25—**Cleveland, O.** National Petroleum Association meeting.
28-May 3—**Henderson, N. C.** Automobile Show.

MAY

1-10—**Melbourne, Australia.** International Motor Show.
8—**New York.** Society of Automotive Engineers, aeronautic meeting.
23-27—**Atlantic City, N. J.** American Society for Testing Materials annual meeting.
25-29—**French Lick Springs, Ind.** Society of Automotive Engineers' summer meeting.
29-July 13—**Posen, Poland.** International Motor and Transport Show.
30—**Indianapolis, Ind.** Automobile Race.

JUNE

2-12—**Paris, France.** Automobile Salon.
16-25—**London, England.** Olympia Motor Show.

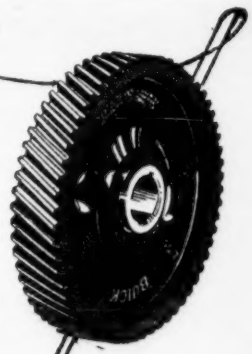
NOVEMBER

10-14—**Cleveland, O.** Motor and Equipment Association Show.
17-22—**Cleveland, O.** National Standard Parts Association Show.

DECEMBER

6-17—**Brussels, Belgium.** Automobile Exhibition.

TEXTOLITE
TIMING GEARS



The Factory Fit Is Final

Sometimes service men like to make adjustments according to their own ideas.

With Textolite timing gears the factory fit is final and can't be altered.

There is no compromise with accuracy in a good gear drive. It is a token of good manufacture throughout the car.

830-73

JOIN US IN THE GENERAL ELECTRIC HOUR, BROADCAST EVERY SATURDAY AT 9 P.M., E.S.T. ON A NATION-WIDE N.B.C. NETWORK

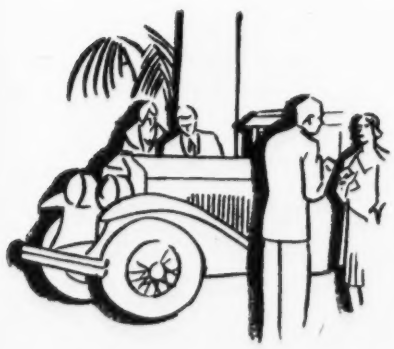
GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN PRINCIPAL CITIES

If a high income is essential to car ownership in New York—

WHY

do so many low-incomed people buy cars?



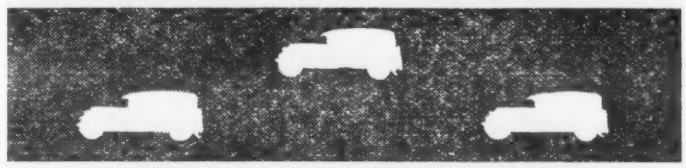
THE NEWS

New York's Picture Newspaper

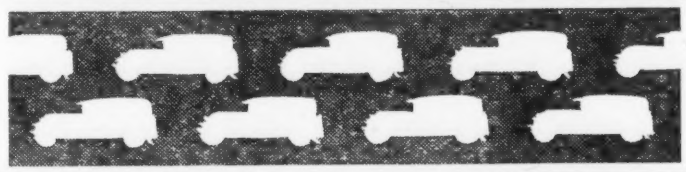
220 EAST FORTY-SECOND ST., NEW YORK

Tribune Tower, Chicago — Kohl Bldg., San Francisco

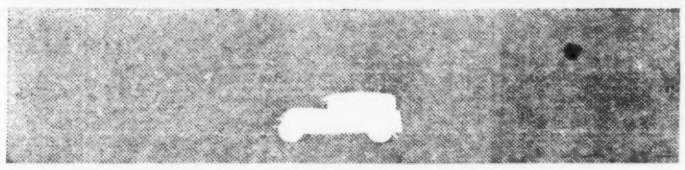
$5,000 and up districts
furnished
18.3% NASH sales
14.8% GRAHAM sales



$4,000—$4,999 districts
furnished
23.0% NASH sales
21.6% GRAHAM sales



$2,000—$3,999 districts
furnished
55.6% NASH sales
58.4% GRAHAM sales



Under $2,000 districts
furnished
3.1% NASH sales
5.2% GRAHAM sales

SOURCE: News 1929 New Car Registration Analysis

Over 50% of NASH and GRAHAM sales in New York in 1929 came from the $2000-$4000 districts

EVERY year a great many of the executives in the automobile industry come to the New York Show. They lease hotel quarters in the Grand Central district, bull the market for theatre tickets, patronize all the best restaurants, subsidize some of the night clubs, tip early and often and lavishly, roll up a man-size expense account—and go home with the conviction that New York is a pretty expensive place; that it takes more money to live here. And as a corollary, that it takes more money to own a car.

Consequently, many of them have the impression that the only car buyers and prospects worthwhile shooting for are the upper income brackets. Certain publications have fostered this impression, to alibi and sell small circulations. Lazy salesmanship has cheerfully concurred. And erroneous and often erratic sales and advertising plans have been based on this false premise. The market has suffered from a mental hazard.

But the FACTS are more than 56% of all cars priced under $1950 are sold in the districts where family incomes average from $2000 to $4000; and that cars under $1,950 represent 84% of the total sales.

These facts were brought to light by a study made by our research department last year. Nine months of new car sales in four boroughs (Staten Island was omitted) were allocated to the hundred survey districts defined by the New York University Bureau of Business Research in the New York Survey conducted by this bureau a few years back. Population and income averages established for each district made possible the comparison of sales and buying power. (A copy of this study is available, if you write for it on your business letterhead.)

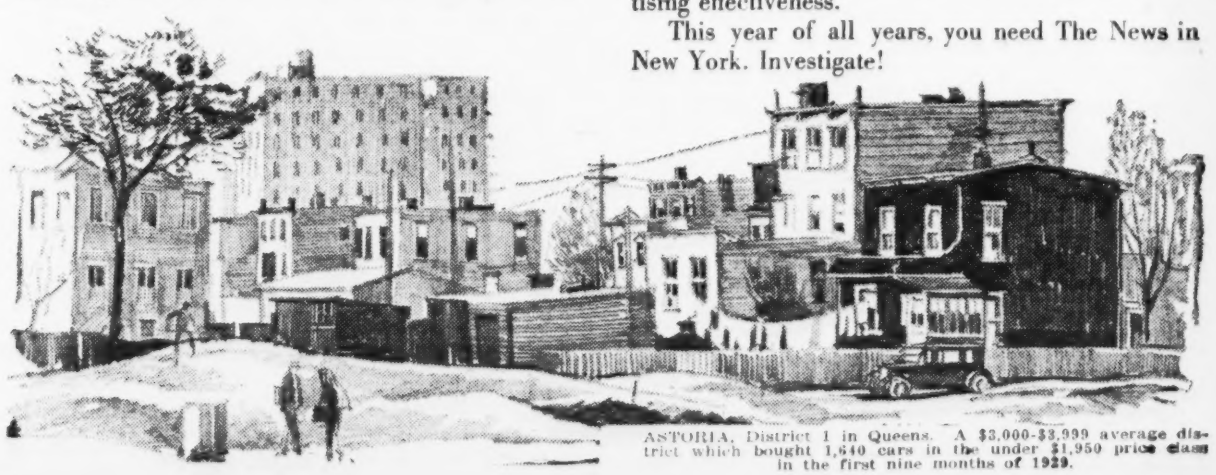
Over 55% of new Nash sales and over 58% of new Graham sales were absorbed by the $2,000—$4,000 districts. The sales of these two makes, taken at random from our list, jibe with the general finding—that more than 55% of new car sales are made in mentioned middle class districts!

If high income is essential to car ownership—WHY do so many low incomed people buy cars?

STRIPPED of all the bunk and hokum, automobile selling in this market is mass merchandising, as it is in all other American markets; and demands mass advertising! Yet the two papers carrying most of the automobile advertising have only one-fourth or less of their circulations in the middle class districts which absorb the most new cars! One paper reaches 11% of these families, and the other only 7%. The News, on the other hand, reaches two out of three families in these districts; and more families in all other types of districts than any other New York newspaper.

The News can do a better job for you in this market! It goes to seven-tenths of all city families, one-fifth of all suburban families (more than any other paper). Its huge circulation offers majority coverage in one package, at much reduced cost. Its small pages offer increased visibility, greater advertising effectiveness.

This year of all years, you need The News in New York. Investigate!



ASTORIA, District 1 in Queens. A $3,000-$3,999 average district which bought 1,640 cars in the under $1,950 price class in the first nine months of 1929.

Producing Crowned Fender At Low Cost After Research

By D. D. WENSINK
Stolper Steel Products Corp.
Milwaukee, Wis.

THERE has been an insistent demand from the automotive industry for several years for a fender which would be a duplicate in style and appearance of those furnished on the passenger cars of the large scale producers, but which could be built without elaborate and expensive die equipment. This demand has been the result of a decided trend of the engineering departments of the industry to design a fender with a deeper crown, and a resulting more attractive appearance, than was previously used. This has all but obsoleted the flat or more shallow fender formerly in vogue.

It has been a comparatively simple problem for the manufacturer with quantity production to equip his cars, buses or trucks with the new style of fender because he could afford the very expensive dies which were essential for stamping this type of equipment. On the other hand, when the call went out to the engineering deparments of the smaller producers to dress up their units by duplicating this new type of fender the solution was not so simple. Most of these smaller companies, with a production of from a few hundred to 4,000 or 5,000 units a year, had been using what is known as a rolled fender as contrasted with the drawn or stamped fender used by their larger competitors.

It was soon discovered by the manufacturers of automobile parts, selling to the automotive industry, that the fender rolling equipment which they had been using up to that time was unsatisfactory for producing a fender with the depth of crown now required. It was apparent that the many production problems involved in making this type of unit made it necessary to scrap old methods and equipment and to design entirely new machinery especially fitted to the job.

The Stolper Steel Products Corporation set to work to find a solution, and as the result of extensive research and experimentation aare now in a position to furnish what is required. With the equipment which has been recently built and installed they are in a position to furnish a deep crown fender that is made with rolls, costing a few hundred dollars, as contrasted with the cost of several thousands of dollars which would be required for the dies to do a similar job.

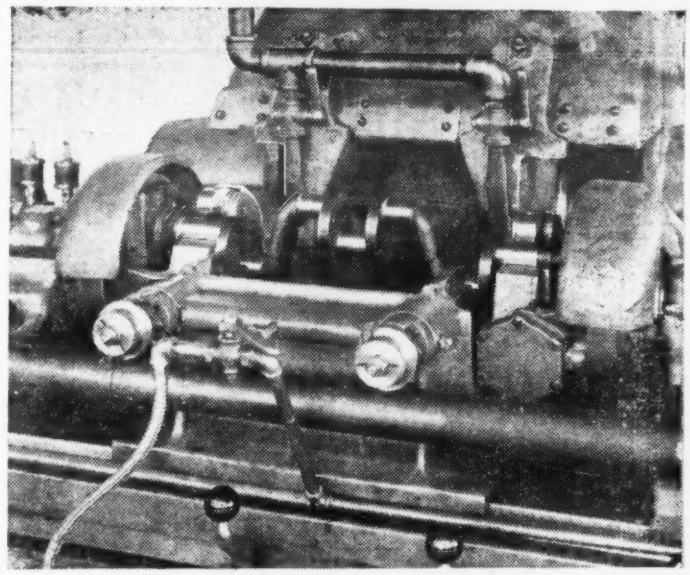
Rolled fenders are produced from either full pickled or auto body sheets and must be of extra deep drawing quality. The thickness of the sheets will vary from fourteen to eighteen gauge, according to the specifications of the car manufacturer whose requirements are being supplied.

The sheets are sheared to the desired width, and then a flange is turned up on both edges of this sheet at right angles. This flanging is done on a power brake. The resultant strips are then fed one at a time between the upper and lower rolls or dies of the fender crown rolling machine, and the sheet passed back and forth several times. This operation simultaneously shapes the contour of the fender to that of the rolls between which it is passing and at the same time forms the curve of the fender. This required curve or wheel radius is obtained by the movement of the guides or the shoes, which are located one ahead and one in back of the lower roll. These shoes are gradually moved upward against the lower surface of the strip being crowned, which thus forces it to assume a circular shape.

POWELL BROS. MOVE

Joplin, Mo., April 18.—The Powell Brothers Truck Company, G. M. C. truck distributor in fourteen southwest Missouri counties, has moved to larger quarters on the northwest corner of 2d and Joplin Streets.

Precision Grinding Machine Development During 1929



Landis 16x32-in. type IW multiple wheel machine, shown above, has been used some time for simultaneously grinding either the outside pins or the inside pins of four cylinder crank shafts

By F. W. PENSINGER
Landis Tool Co., Waynesboro, Pa.

PRECISION grinding machine development shows substantially the same trend now as it did a year ago. At that time the following five factors were noted:

(a) The ever growing number of semi-automatic machines.
(b) The increased use of hydraulic power.
(c) The development of multiple wheel machines.
(d) The growing use of the large diameter grinding wheel.
(e) The almost total motorizing of all grinding equipment.

Semi-automatic hydraulic grinders for many special jobs have been the Landis answers to the cry for more production with fewer operators and in less space.

In the new 50x40-inch semi-automatic hydraulic cam grinder, Landis has presented to the automotive industry the truly outstanding grinding machine development of the year. So human-like is it in operation that the operator needs but load and unload the work and manipulate two convenient controls; all cams on the shaft (including the fuel pump cam, if one is used) are completely and automatically ground to size. While all this is taking place on one machine the operator may load and unload two or three additional machines, thereby either tripling or quadrupling his production. Close accuracy is duplicated shaft after shaft. Finish is all that could be desired.

Features of particular note include frequent application of hydraulic power, end wheed spindle drive through multiple V-belts, an improved under-slung type attachment and automatic slow down control for the work drive motor.

The type B semi-automatic hydraulic side gear grinder is an excellent example of the highly specialized production machines being offered by Landis. Operation is comparatively simple, as the operator needs but load and unload the work and operate two controls. Both the hub and face of the side gear are automatically ground to size. Liberal use of hydraulic power, and a cleverly designed diamond holder which is in reality a portion of the wheel fender might be mentioned as noteworthy points of design. One of these machines in a large plant increased production over 300 per cent.

Hydraulic power, due to its quietness, smoothness, ease of control and flexibility has been applied to every new Landis development. Not only is it utilized for traversng the work table, but also for moving the wheel head, footstock center, work rest jaws, work head and work cradle and for truing the grinding wheel or clamping the work. No other form of power makes possible such simplicity of design nor such a wide range of applications. Of the many new Landis machnes marketed during 1929, the larger plain types having proved unusually popular wherever installed. Machines up to 28-inch swing and as much as 16 feet between centers are in operation in a large number of representative plants.

Multiple wheel grinding has been resorted to with much success on certain jobs. The Landis 16x32 type IW multiple wheel machine has been used for some time for simultaneously grinding either the outside pins or the inside pins of four cylinder crank shafts. The photograph shows a set-up. The very latest application of this machine has been to the grinding of main cam shaft bearings.

Combination Machines Feature Developments In Stamping Field

By E. W. HAMLIN
The Akron-Selle Company

THE most essential developments in connection with stamping equipment during the past year have been the tendency to combine three, four, five and six operations into one die, making the part progressive.

For instance, where a stamping is blanked, pierced, shaved, drawn and trimmed, we have found it advisable in items of large production to combine all of these various operations in one die. This greatly increases our production, and likewise reduces our manufacturing costs, enabling us to compete on a very satisfactory basis.

We have also noted the increased possibilities along the line of redesigning castings and making stampings from them. There are great possibilities for future development along this line, and without question millions of parts, which are now being made from castings, can very readily be designed into stampings at great savings in costs; likewise, the elimination of the machining of these castings which was required in every instance. It is our belief that great progress will be made in the redesigning of castings during the next few years.

Considerable attention has also been given to the strength of stampings, due to various methods of ribbing, forming, etc.

There is also much to be done in the field in an engineering way, both with reference to die construction and metal forming.

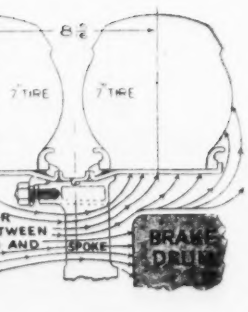
APPOINTS FIVE REPORTERS FOR SIXTH ROAD CONGRESS

Washington, D. C., April 18.—Appointment of five of the seven general reporters who will present the questions on the agenda of the Sixth International Road Congress to be held in Washington next October was announced today by Thomas H. MacDonald, secretary-general of the American Organizing Commission and chief of the United States Bureau of Public Roads. The agenda include six questions, one of which has been divided and will be presented by two reporters.

Those so far named are: Frank T. Sheets, chief highway engineer for Illinois; Dr. Roy W. Crum, director Highway Research Board, Washington, D. C.; E. W. James, chief division of highway economics, United States Bureau of Public Roads; Dr. Henry R. Trumbower, professor of economics, University of Wisconsin, and Dr. Miller McClintock, director Albert Russel Erskine Bureau for Street Traffic Research, Harvard University.

SPEED on AIR...

SAFELY with Dayton Duals



DUAL pneumatic tires accelerate the movement of trucks and buses and make possible the carrying of more and heavier loads.

Speed, however, can mean trouble and expense if you do not have wheels that are positively true-running, cool-running and have the brute strength necessary to endure high-speed strains and shocks.

Speed with safety—that's what you want. And Dayton Duals give it to you. Light in weight—remarkably strong—they will not bend or crack or lose their positive true alignment—actual service in all fields constantly proves it. Center line over hub eliminates bearing failure. Complete rim support prevents the slightest rim slippage. No extra wheel is necessary with Daytons. Only a tire and rim need be carried as a spare. No wheel repairs. The first cost of a set of Daytons is the last and only cost . . . If you will investigate, you will find it will pay to change over your present equipment to Dayton Dual Pneumatic Steel Wheels. Distributors in principal cities throughout the country will give you quick, complete change-over service on Dayton Duals. Specify Daytons on your new trucks and buses.

Dayton Brake Drums
are superior in Strength and Wearing Qualities. The metal, made by a special process in electric furnaces, has an even distribution of small, uniform grains of graphic carbon. Dayton Brake Drums last longer, stay smooth, and save brake linings.

Are Last Summer's Tire Troubles Threatening You Again? Dayton spokes are so designed that strong air currents are forced between rim and brake drum—no air is wasted between the tires. Tires run cool and give greater mileage. Scientific tests prove it.

THE DAYTON STEEL FOUNDRY CO., DAYTON, OHIO

We have acquired the Tigerboy Brake Drum Division of the Massillon Steel Castings Company of Massillon, Ohio

Dayton
The Mark of a Good Wheel

DETROIT

LOS ANGELES

BOSTON

Why We Have Service Stations Everywhere

GABRIEL PRODUCTS

Gabriel Triple-Hydraulic Shock Absorbers for cars of every weight.

Gabriel-Anderson-Ajax Steel Spring Covers permit springs to function noiselessly and efficiently under all weather conditions.

Gabriel Gauges which accurately show at a glance day or night the oil level, battery solution and gas tank contents.

A MORE COMFORTABLE RIDE—that's what we're all after! It depends upon good shock absorbers, but it also depends upon good springs, shackles, tire inflation and seat cushions.

• Good engineers design these important parts and they are properly adjusted when a new car is delivered, but rough roads, weather, dirt, rust and accidents are always at work.

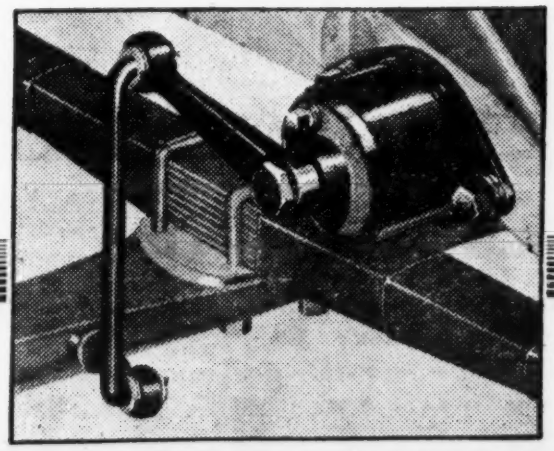
• Shock Absorbers have been so well sold that they get the blame for every kind of discomfort. That isn't quite fair. Other things must be right, too.

• That's why we have service stations everywhere—to let experts find out just what is wrong, and correct it.

• Gabriel accepts the responsibility for a comfortable ride. Neither car manufacturer nor car dealer has to worry about it. The Gabriel service organization—and there is no other like it in size and experience—knows comfort and delivers it.

• These Service Stations everywhere also make it easy to give 1930 comfort to older models, by installing Gabriel Triple-Vane Hydraulics—a real service and a source of profit to every car dealer.

• Gabriel, Cleveland, is headquarters for this national service organization.



Gabriel Triple-Hydraulic Shock Absorbers
Working parts and housing of steel—precision made—no leaks—rugged built, to perform continuously.

GABRIEL

COMFORT IN MOTORING

Motor Shares Off Slightly in Irregular Week

FIRST SETBACK IN TWO MONTHS

Small Reaction Comes After Seven Weeks Of Advance

AUTOMOTIVE DAILY NEWS STOCK PRICE AVERAGES

	April 12	April 17	Net Chg.
60 Automotives	40.69	39.75	— .94
20 Passenger cars	42.15	41.33	— .82
20 Accessories	46.01	44.70	—1.31
10 Rubbers	41.61	41.05	— .56
10 Trucks	26.20	25.37	— .83
ACTIVE STOCKS			
General Motors	53	51¼	— 1¾
Chrysler	42	39¾	— 2¼
Packard	21⅜	20½	— ⅞
Mack	83⅝	83¼	— ⅜
Goodyear	92	89	—3
Electric Auto-Lite	110¼	110	— ¼
Bendix	53⅞	52¼	—1⅝

By CONRAD ALEXANDER

NEW YORK, April 18.—After seven consecutive weeks of advancing prices, shares of automotive manufacturing companies listed on the various exchanges had a slight setback this week in the four-day trading period. The stock exchanges were closed today and will remain closed Saturday.

It was not surprising that after such a long advance, even though the gains each week were small, the motor stocks should have a small corrective reaction. There were no alarming factors in the decline and the average price of sixty representative stocks used in the Automotive Daily News compilation dropped only .94 of a point.

While it is true that there has not as yet been sufficient buoyant news from the manufacturing centers to send the motor shares up sharply, there has been nothing to justify a severe falling off and it is likely that the stocks in this group will move within a narrow range until some definite news as to April retail sales is received and reflected through the operations of the manufacturers.

The most encouraging factor at present is the low inventories of new car stocks in the hands of both the makers and the fact that thus far retail sales have been more sustained that production, clearly demonstrating that the manufacturers are avoiding any overproduction. As a matter of fact, there is much more danger of a shortage of cars in the first half of this year than an excess supply.

The average price of the sixty automotive stocks closed the week at 39.75, as compared with 40.69 for last week, which was a small falling off considering the irregular character of the market this week. The passenger car group closed the week at 41.33, off .82 from last week. The biggest loss was sustained by the accessory group, which declined 1.31 points to 44.70 from 46.01. The rubber group was off .56 of a point to 41.05 and the trucks .83 of a point to 25.37.

There were few outstanding performances among the motor stocks during the week. General Motors failed to resume the leadership that it developed in the preceding week, and Chrysler, which showed real strength last week, also weakened and dropped back below 40.

Financial circles are estimating that General Motors will earn about 90 cents a share in the first quarter, as against dividend requirements of 75 cents, and that Chrysler will just about break even. The first two car manufacturers to report earnings, Willys-Overland and Hupp, issued their statements during the week. Both of these reports held encouragement from the very fact that both companies reported profits. It is estimated that companies making money or breaking even in the first quarter should enjoy fairly profitable year, as it is generally conceded that the first quarter will make the poorest showing in relation to 1929 of any other period.

The fact that Willys-Overland and Hupp, with curtailed production, were able to show net income available for the common stock shows that overproduction, after all, is the great danger to the industry, rather than a reduced volume. It is believed that a production of 4,000,000 cars and trucks by the industry will return fair profits, and the most conservative estimates for 1930 place the output at well above that figure.

The most recent estimates state that Graham-Paige Motors Corporation will be another company to make a good showing in the first quarter. That was the first three months' period in which Graham-Paige operated with its reorganization in full effect and, while a large profit is not expected, the company will probably break even. No estimates are yet available on the operations of the other manufacturers for the first three months. The accessory and equipment makers to report thus far were able to show good records.

NATIONAL ELECTRIC AND INCA ANNOUNCE COMBINE

Fort Wayne, Ind., April 18.—Linking up of the Inca Manufacturing Corporation of this city with the National Electric Products Corporation of Pittsburgh and New York and the probable expansion of the Ft. Wayne plant to a much larger size, has been announced by George A. Jacobs, president of Inca. There is no outright sale and the deal is more in the nature of a reorganization. Mr. Jacobs will become a vice-president of the National Electric Products Corporation.

It is expected that the Inca plant, which has been operating at less than full capacity, will now operate at full production. An expansion program has been anticipated, with acquisition of land near the present plant for the purpose of adding additional buildings.

Magnet wire is the chief product of the Inca plant, which started production on October 15, 1929.

AUTOMATIC CAP COMPANY FORMED IN AUBURN, N. Y.

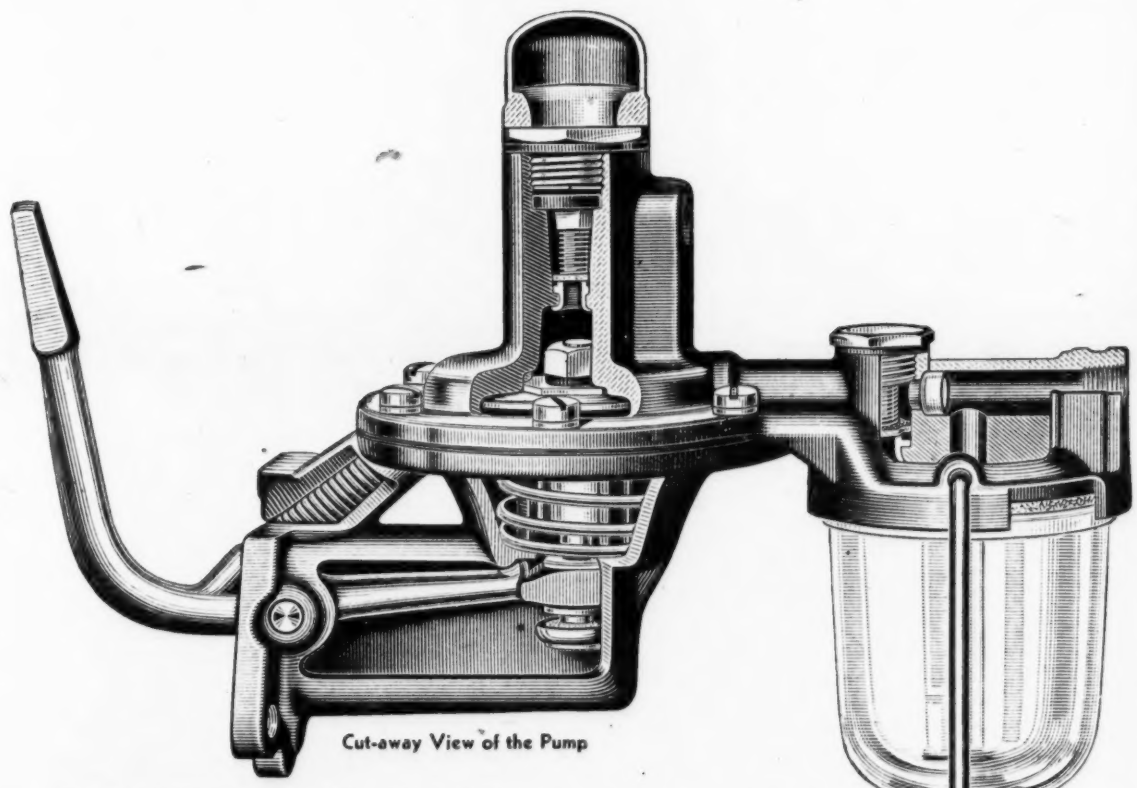
Auburn, N. Y., April 18.—F. B. Wills and associates have organized and incorporated the Automatic Cap Company, and have plans under way to establish and operate a local plant for the production of a patented automatic gas tank cap for automobiles and trucks.

DETROIT GEAR SALES SET NEW MARK FOR QUARTER

Chicago, April 18.—Sales of Detroit Gear and Machine Company, subsidiary of Borg-Warner Corporation, in the first quarter of this year were the largest of any similar period in the history of the company and 7 per cent. ahead of the first quarter of 1929, C. S. Davis, president of Borg-Warner Corporation, announced today. April shipping schedules of Detroit Gear are 45 per cent. ahead of shipments in the corresponding period of 1929.

Priming time is

"The Pump with the Compensating Diaphragm"



Cut-away View of the Pump

The Diaphragm and Plate—The "Heart" of the Pump

Diaphragm

Plate

Note the even surface of the diaphragm, also its freedom from wrinkles in the flexing margin. (Edge is turned up to show laminations.) The plate has a specific shape designed to compensate for the "bag effect" of the diaphragm and also to prevent wear. The size and form of this plate working against the diaphragm brings about a material reduction in priming time.

STEWART-

TRAFFIC TESTED

M'KEE SYSTEM REDUCES TIME

Eclipse Fuel Describes New Method for Cleaning Motor

By E. E. MAGNUSON
Eclipse Fuel Engineering Company, Rockford, Ill.

DURING the last few years there has been an increasing demand on the part of the automotive industry for a new method of cleaning motors, gears, transmissions, etc., which will be more efficient and economical than the old dip tank method.

With the dip tank method a large tank of solution must be heated to and maintained at a high temperature. After the solution has been brought up to temperature and the parts placed in the tank, cleaning is entirely dependent upon chemical reaction to dissolve the grease and oil. The process is necessarily slow and costly even though agitators are used in the tank to speed up the work.

A new type of equipment for doing this work has been developed which is gaining in favor. It is steadily replacing the old dip tank method. This is the McKee Cleaning System, manufactured by the Eclipse Fuel Engineering Company of Rockford.

With this system only a small tank of solution is heated at a time. This boiling hot solution is driven under seventy pound steam pressure through a special spray nozzle on to the parts which are placed in wire baskets over the old dip tanks. The grease and oil are rapidly cut and drain down through the basket into the dip tank, leaving the parts clean and bright.

Cleaning can be done with this new method in about one-fourth the time required with the dip tanks. Analysis, as well as impartial reports submitted by observers, substantiates this claim. With either method the chemical reaction is, of course, the same, but with the new system the solution is applied under 70 pounds pressure, which speeds up the process to a marked degree.

It is further claimed that parts cleaning is not the only use for this system. It is used for motor and chassis cleaning. Automobile cleaning today has resolved itself into more than a mere body-washing job. Hard, caked mud, grease, road oil and grime must be removed from under the motor, chassis and underside of fenders to do the thorough job which many car owners, motor transit companies and large trucking concerns are now demanding. Auto sales agencies, particularly, find the equipment valuable in cleaning new "driven-in" cars preparatory to placing them on the sales floor.

The manufacturers have published a booklet illustrating and describing the uses of the McKee system.

Vesta Corp. Creates Dealer Profit Plan

(Continued from Page 1)

percentage of the better quality types. This is good business, as it provides the customer with a battery that has more dependable and greater starting power, especially in cold weather.

Complete particulars regarding the new profit-producing plan for battery dealers may be had by writing the Vesta Battery Corporation, 6501-51 West 65th St., Chicago, Ill.

greatly reduced by the New STEWART WARNER FUEL PUMP

With the new Stewart-Warner Fuel Pump, priming time is greatly reduced—due to the compensating diaphragm and to the extra large diameter of the plate which reinforces it.

The plate—shown at left with diaphragm—is so shaped that it compensates for the "bag effect" assumed by the diaphragm in operation. In the upward movement of the diaphragm, its "bag" becomes cone shape. In its downward movement, the slack in its free center is entirely taken up by the form of the upper plate. Thus the reduction in priming time.

The plate also prevents wrinkling. It prolongs life of diaphragm. It increases fuel delivery rate at all operating temperatures.

Size for size, this pump delivers more fuel per stroke, than any other fuel pump. Note its other features listed below. Investigate.

5 Big Outstanding Features of this Pump

1. Compensating Diaphragm greatly reduces priming time.
2. Vapor Dome promotes uniformity of discharge pressure.
3. Constant Fuel rise prevents segregated vapor traps.
4. One-piece Cam Lever—one pivot only—no linkage.
5. *Self Draining Follower Spring Pocket.*

A Complete Source of Accessory Supply

We can care for your requirements on a complete line of accessory equipment—built to quality standards—backed by our famous world-wide system of service. Let us figure with you on: Fuel Feed equipment of all types, Carburetors, Speedometers, Bumpers, Cigarette Lighters, Horns, and Hydro-Cushions, the first and only spring controls, 100% self adjusting to all loads and all roads.

Our Engineers Are at Your Command

STEWART-WARNER CORPORATION
Diversey Parkway, Chicago, U. S. A.

WARNER PRODUCTS

EXPERTS DISCUSS PRESENT TRENDS IN ENGINEERING

(Continued from Page 1)

that with the four speeds, the third speed can be used for accelerating or hill climbing and the fourth speed can be made to run at a motor speed less objectionable to the operator and passengers.

Cars can be made lower along with the greater development of shock absorber springs, etc., but it would seem to us that the ground clearance is now almost down to a minimum. Head room should not be decreased, because comfort is all important and the lower designs must be accomplished without sacrificing headroom.

If higher speeds become common, naturally high horse power motors must continue to be used to enable operators to attain and maintain the high speeds.

Oil-cooling devices are going to be necessary on extreme high speed motors, because the temperature of the oil increases so very rapidly with high motor speeds, and if cars are to be made extreme in lowness, the radiators will be made of such height that some auxiliary means must be resorted to for cooling the oil and to help keep the motor as a whole cool.

Rubber will be used more extensively on automobiles as the power and speed increase, due to the fact that vibrations hitherto unknown, become objectionable and must be dampened out by the use of flexible mountings. The industry as a whole is just beginning to learn something about rubber and what can be done with it, and it seems to us that the use of it is just really getting started.

AMERICAN PUBLIC DEMANDS PERFORMANCE

By GEORGE H. FREERS
Chief Engineer Marmon

With the development of new fuels, new manifolds and new cylinder heads, there is no question that the compressions of engines will be higher in the future.

It is rather difficult to state at present whether the four-speed transmission will gain ground or not. With the development of three-speed transmissions with quiet second gears and extremely easy shifting at high speeds and with the continued increase in the size of engines, believe that the four-speed transmssion will not gain ground rapidly or extensively.

The American public demand the extreme in performance and the ultimate ambition today of the present automotive engineer is to obtain the highest horse power and torque possible out of a given engine. The writer does not believe that engines will increase in size appreciably, but that greater efficiency and higher powers will be obtained from the present-day size of engines.

It is rather difficult to lower present cars without the use of either Hypoid or worm gear drives. The tendency, however, is to get them as low as possible, and this is usually done by sacrificing some head room and road clearance.

If high speed engines are to come into general use, and that seems to be the present trend, and even to go to higher speeds, some methods of oil cooling will be necessary.

There is no question in the writer's mind that the use of rubber throughout the car will be greatly augmented. The use of rubber spring shackles, rubber engine mountings, rubber shims under the bodies, molded rubber on running boards, etc., have proved their worth and believe that there will be many more uses developed in the near future.

HIGHER COMPRESSION COMING

By N. E. WAHLBERG,
Chief Engineer Nash.

We believe that with the successful merchandising of Ethyl gas compressions will be higher.

We doubt that four-speed transmissions will gain ground. The ordinary sedan body requires a rather low gear to obtain maximum speed and a high ratio does not seem to be desired by the public. American driving conditions do not seem to us to offer much opportunity for the use of a four-speed gear box.

It is possible to make somewhat lower cars with ample head room if axle housings are reduced in outside diameter. The present "banjo" type axle wastes both ground clearance and riding clearance, and we feel this can be corrected if some effort is made in this direction. We would like to see lower cars, as we feel that the car looks consider-

(Continued on Page 17)

Toledo Automotive Concerns Spend $11,000,000 in Building

(Continued from Page 1)

reports being received as part of a survey by Automotive Daily News.

New building permits issued in Detroit in March totaled $5,230,000, as compared with $3,578,000 in February.

TOLEDO, O., April 18.—Investments totaling more than $11,000,000 have been made by automotive concerns and allied industries in the Toledo area in the past six months for property and equipment to better service or meet expected increases in demand for their relative products. This total does not include materials.

This six-month period, following a period of expansion in almost every branch of the industry represented in the Toledo territory, is believed to have set a record for actual construction. Included in the total are three new plants costing approximately $1,000,000 each. Another plant, a new branch of the Newton Steel Corporation, erected along the west shore of Lake Erie, north of Toledo, cost $7,000,000.

The Newton Steel plant, opened February 17, 1930, was built to care for the needs of the automotive industry of the Toledo and Detroit areas.

Electric Auto-Lite Company has placed in operation an addition costing $1,000,000 for production of motors and generators for one of the industry's largest automobile manufacturers. In addition, Electric Auto-Lite formed a subsidiary company known as Electric Auto-Lite of Canada, Ltd., for operation of a plant built late in 1929 at Sarnia, Ontario. The Canadian plant cost $500,000. Auto-Lite also is understood to have under consideration a new administration building at Toledo. No details of the proposed building have been announced. The Wubco Battery Corporation, Electric Auto-Lite subsidiary at Swissvale, Pa., recently placed in operation a storage battery plant. This expansion is not included in the total.

The Gordon Mather Manufacturing Company, allied with the Mather Manufacturing Company, producer of automobile springs, completed and placed in operation a plant for the manufacture of automobile bumpers. This plant, equipped, cost approximately $1,000,000.

Textile Leather Products Company, formerly of Newark, N. J., is erecting a $1,000,000 plant here expected to employ 1,000 workers at near peak production. This plant, expected to go into production soon, will be devoted to making artificial leather and other automotive textiles.

Libbey-Owens Sheet Glass Company has a $500,000 addition for laminated plate glass production under construction. This plant, when completed, will double the laminated glass facilities of the company, recently merged with the Ford Plate Glass Company into what is to be known as the Libbey-Owens-Ford Glass Company.

The Electric Power Maintenance Company, specialist in automotive electrical systems, has a new home under construction here which is expected to be completed by June 1 or shortly thereafter. The building, at 24-26 17th St., here, will cost $100,000.

In addition to these purely plant construction programs, the Toledo Steel Products Company, manufacturer of steel valves and other automotive steel products, recently placed in operation more than $200,000 in new equipment designed for production of a new heat-resistant steel for valves.

Construction and expansion totals for the industry in Toledo during the past twelve months would set this total much higher. Many plants, including Willys-Overland, Inc.; Champion Spark Plug Company, Libbey-Owens Glass Company, City Machine and Tool Company and the Duro Manufacturing Company, completed plant expansion programs before November, 1929. These additional facilities have been placed in operation producing accessories, parts and other fabrication units for principal automobile manufacturers throughout the United States.

Large Construction Work Now Under Way in Chicago

CHICAGO, April 18.—The matter of plant extension and construction activities among automotive concerns in this territory finds the various companies broadly divided into three classes. Some took care of their needs for both 1929 and 1930 last year, others have just completed additions to their former facilities, while in one notable instance construction is still under way on a large scale.

Due to the introduction of two new products, bumpers and brakes, the Stewart-Warner Corporation found its existing plant space inadequate and has been forced to erect two new buildings. The first of these is now complete, occupies the equivalent of two city blocks in length and is being used for the manufacture of bumpers. It is declared to be a model factory for the purpose, with all operations handled complete under one roof. The brake end of the company's business has required still another plant—in reality an addition to the present bumper shops—and work is now in progress on the extension.

The Borg-Warner Corporation is another concern that is forging ahead to take care of present requirements and to anticipate those of the future. Occupancy has recently been taken of a new plant in the Clearing manufacturing district on the outskirts of Chicago, where it will be possible to increase the output of Borg & Beck clutches. The structure is three stories in height, provides 30,000 square feet of floor space, and was erected at a cost of $145,000.

At West Pullman, a suburb of Chicago, Borg-Warner has purchased buildings giving 300,000 square feet of floor space. Here the company has established rolling mills for its Ingersoll steel and disc division, and in addition to taking care of its present steel manufacturing requirements, the facilities are available to use for other purposes as future needs demand. It is planned also at West Pullman to replace some of the present buildings with new structures whenever desirable.

From headquarters of the Bendix Corporation it was learned that immediate needs have been met through erection of new factories at South Bend, Ind., to house the Stromberg Motor Devices division's plant, formerly at Chicago, and the Bendix Cowdrey Brake Tester, Inc., division, which has been removed from Fitchburg, Mass. Another building has been added in South Bend to be used as a huge garage and for other purposes.

A $1,200,000 appropriation las year for purposes of new construction and the consolidation of plant activities has proved adequate for 1930 requirements of the Houdaille-Hershey Corporation's activities, it was stated officially at offices of the company. Work started last summer and has since been finished, the biggest single project being erection of a large new plant at Oshawa, Ontario, Canada, occupied now by the Skinner Company, Ltd., a division of Houdaille-Hershey. No consideration of an expansion program is due to come up before July, when the 1931 program will be under deliberation.

Steady increases in the truck and tractor end of the International Harvester Company's have compelled added facilities consisting of a new motor truck engine plant at Fort Wayne, Ind., and an addition to the Farmall Tractor Works of the company at Rock Island, Ill. Both of these factories are in operation. In the annual report, just issued, it is stated that the 1930 expansion and construction program will be limited to the erection of new sales and service stations for the company's automotive products in various parts of the country.

The Pines Winterfront Company is another concern that completed a new plant late in 1929 and as a result has found its increased facilities sufficient to take care of augmented business. The new factory occupies about two-thirds of a site containing 194,000 square feet.

New Buildings for Dealers Under Way in Philadelphia

PHILADELPHIA, April 18.—While there is at this time comparatively little construction work in this city and vicinity directly on the part of the automotive trades, a number of real estate concerns and builders are both completing and planning more or less expensive structures designed for occupation by automobile and truck dealers and distributors. Most of these buildings have been put up speculatively in so far as obtaining automotive trade tenants therefor is concerned, but a few of them have been leased outright.

The Ebert Motor Truck Company, Inc., now at 24th and Brown Streets, merchandising Federal trucks, has secured a long-term lease for approximately $300,000 on a one-story showroom, sales and service building that soon will be erected on the site of the old Prospect Brewery at the northeast corner of 11th and Oxford Streets.

Several large buildings on North Broad Street, which previously were occupied by car distributors, but which have been vacant for some time, are again to be tenanted by automobile concerns. The latest case of this kind is covered by the announcement that shortly Ralph W. Cook, for years connected with the Cadillac and the Peerless in this city, will distribute the Bantam Austin cars from the large building at 720 North Broad Street, occupied at different times by the Hupmobile, Stearns-Knight and other organizations. Mr. Cook expects to have cars by May.

Since the first of the year, Bushong Motors, Inc., distributors of Oakland and Pontiac cars, 725 North Broad St., opened a used car salesroom, in addition, at Broad and Tioga Streets; Fred K. James, as De Soto dealer, opened salesrooms at Orthodox and Paul Streets, Frankford, and the Wilkie-Buick Company, formerly at 1415 North Broad, moved across the street into the large building at one time occupied by the Kelly-Springfield Tire Company.

Only a short time ago United Motors Service, Inc., opened large new quarters at 1624 Hunting Park Ave., having removed its main business from the location at Broad and Callowhill Streets, which it had occupied for a number of years. It is continuing to operate its annex at 1434 Callowhill.

The Public Service Interstate Transportation Company, operating a motor bus fleet, has just leased the first floor of the building at the southeast corner of Thirteenth and Arch Streets, formerly occupied by the Bell Telephone Company. The new quarters will be opened about May 1, as the Philadelphia bus terminal of the company. There is also talk of other bus terminals being established in that general locality.

There are almost continuous expansions of chain accessory concerns, some of which are setting up new branches every few months in various sections of the city. Some of the larger tire concerns have been expanding in the past few months. The rate of establishment of new quarters for lubrication specialists is extremely rapid and oil filling stations are being built by a number of large concerns at an astonishing rate. Public garage building, which was rapidly going forward at the close of last year and the first part of 1930, has somewhat slowed up, but it is believed this is only a temporary lull.

GOVERNMENT SURVEY SHOWS LOWER TIRE STOCKS FOR DEALERS

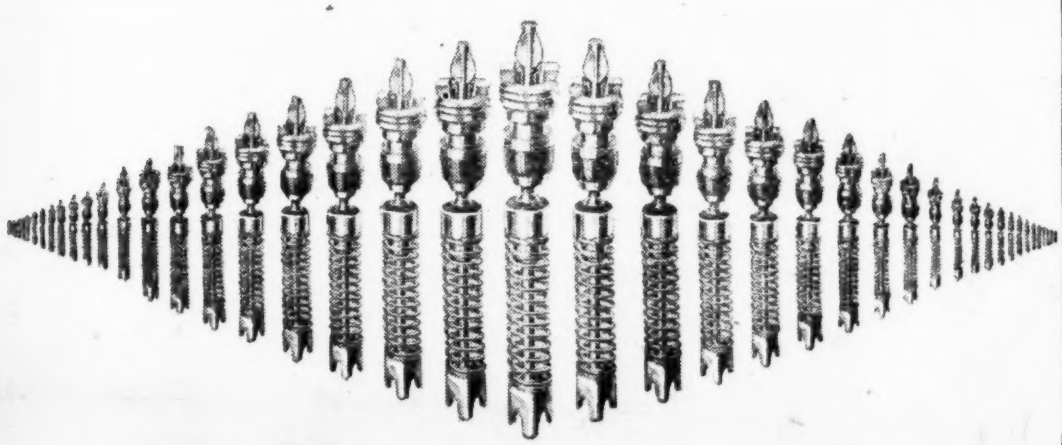
(Continued from Page 1)

ber 1, 1929. There were no comparable stastics for April 1, 1929.

Inner tubes held by dealers average 109, as compared with 143.5 for April 1, 1929.

In the past the average stock per dealer figure of the preliminary report has been raised slightly after tabulation of late returns for the final report.

For example, in October, 1929, the final average casings per dealer figure was 0.7 casings higher than the preliminary, and in April, 1929, the final average was 4.1 casings higher. An analysis by volume groups has been prepared of the reports from dealers having stocks of casings and a comparison made to the survey of April 1, 1929

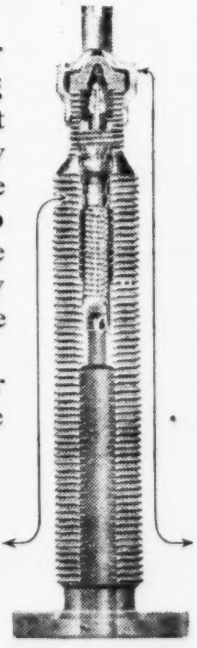


Millions of
Schrader Valve Cores
and every one made with watch-like precision

MILLIONS of Schrader Valve Cores are giving satisfactory service throughout the world. Ever since the early bicycle days, the Schrader Valve Core has held air in tires so well that millions of users have hardly given it a thought. They have depended on its reliable service as a matter of course.

Thus it was through sheer merit that the Schrader Valve Core won world-wide popularity. Today, with every improvement to meet the increasing demands of service, the Schrader Valve Core is still recognized as the most efficient device for holding air in tires.

It is a scientifically constructed mechanism made with watch-like precision according to sound, proven principles of air control.



The red rubber seat washer is the vital part of the Schrader Valve. At this point the valve opens to admit air, and closes to retain it. The valve will remain airtight if this seat washer is clean and in good condition.

The Schrader No. 880 Valve Cap is the second protection against the escape of air. It seals the mouth of the valve stem and prevents a loss of air even though the valve inside may be damaged or worn out.

A. SCHRADER'S SON, Inc. BROOKLYN, Chicago, Toronto, London

Be sure it's a Schrader—Look for the name

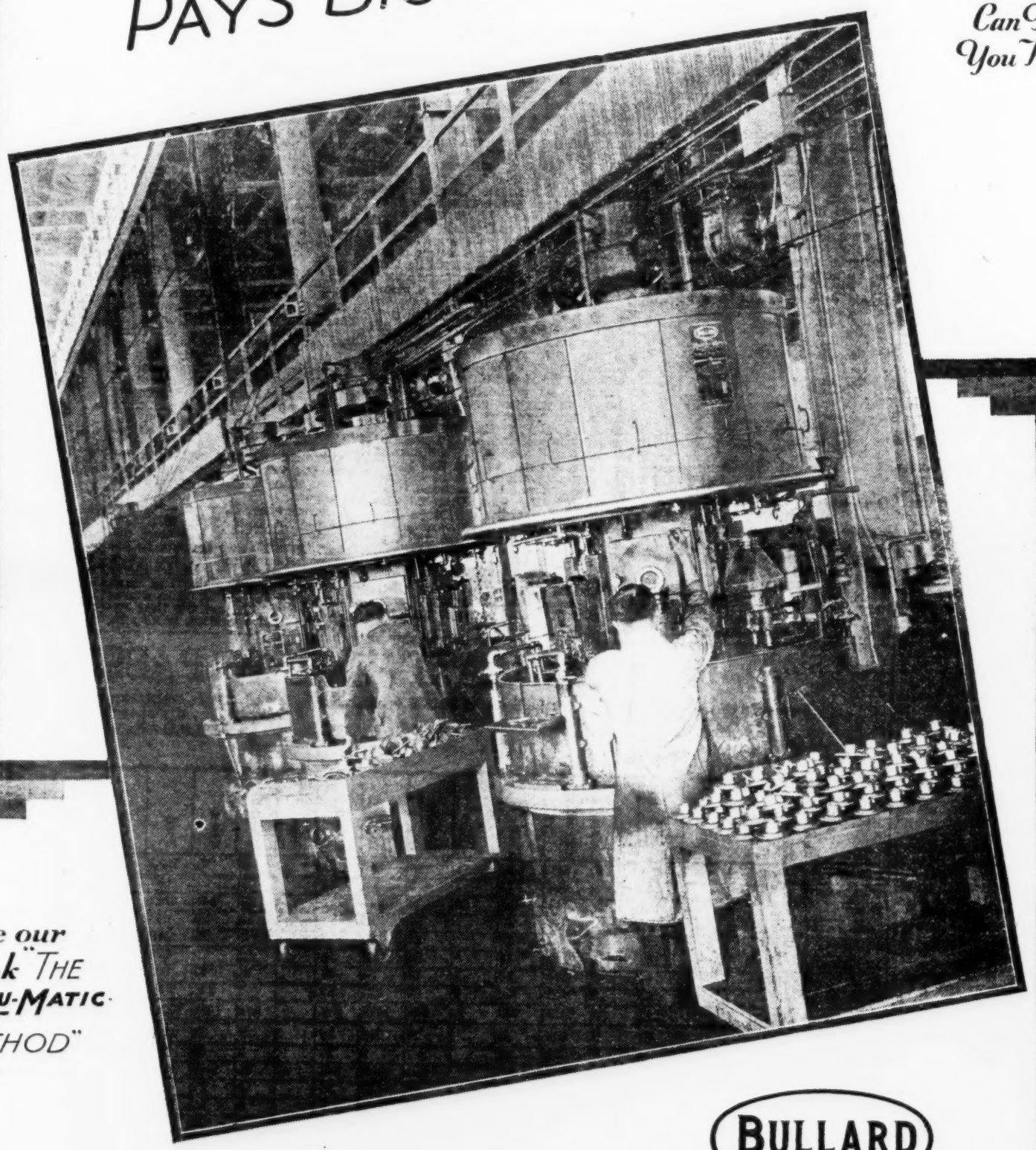
TIRE VALVES Schrader TIRE GAUGES

Makers of Pneumatic Valves Since 1844

THE MULT-AU-MATIC METHOD

PAYS BIG DIVIDENDS

Our Engineers Can Tell You How



See our Book "THE MULT-AU-MATIC METHOD"

BULLARD

THE BULLARD COMPANY

BRIDGEPORT, CONNECTICUT.

Recent Developments in Special Welding

MULTIPLE HEAD WELDING PRESS

Designed for Practically Any Number of Spot Welds

By ALBERT E. HACKETT and CHARLES E. SHEARER
Thomson-Gibb Electric Welding Company
Lynn, Mass.

MANUFACTURERS of automobiles have been using resistance welding in most of their ordinary assembling operations for several years. There have been, however, many recent developments of special welding equipment for the automobile builder that have enabled him not only to lower his costs and speed up production, but to greatly improve his product.

MULTI-HEAD WELDING PRESS

By far one of the most outstanding recent developments is the multiple-head welding press, introduced and patented by the Thomson-Gibb Electric Welding Company of Lynn, Mass., and Bay City, Mich. This equipment can be compared to the multiple spindle drill press. Practically any number of spot welds can be made at one time without moving the work. Any number of individual welding heads can be applied to a machine. The heads can be adjustable and spots can be made as close together as one inch.

The heads can be designed to operate in any plane and more than one battery of heads can be built into a machine for the multiple spot welding of even the most complicated unit.

For door panels, body sections, fenders and fender wells, wheels and countless other units the multiple-head welding press offers unusual advantages.

TWIN SEAM WELDER FOR MUFFLERS

Another remarkable welding achievement is the Twin Seam Welder, especially developed for muffler shells. Formerly muffler shells were seam-welded in great quantities, but recent production demands necessitated the design of seam-welding equipment to operate at more than double the speed. The result was the Thomson-Gibb Twin Seam Welder. Instead of a single shell being welded at one time on one machine, the twin outfit allows two shells to be welded at once at greatly increased speeds.

Two self-clamping lower arbors are provided on this special equipment. Each arbor takes a muffler shell. One welding roll moves outwardly, seaming one shell, and at the same time another welding roll moves inwardly, seaming the other shell. The two heads automatically stop at the end of the seams and rise only long enough to permit the operator to remove the welded shells and load two more unwelded ones. The wheels then automatically move to the work and reversal of direction finishes two more shells.

The twin roll principle maintains a constant secondary loop during entire length of seams and permits of unusually fast seaming speed.

THE KNURL-DRIVEN SEAM WELDER FOR GASOLINE TANKS

The perfection of the knurl-driven seam welder has recently enabled the automobile manufacturer to seam weld his terne plated gasoline tanks. The welded gasoline tank is claimed to be vastly superior to the soldered tank, because welding produces the equivalent of a one-piece tank. Thousands are being welded daily without a single leak, and tremendous savings result as well.

In the knurl-drive principle there are provided two steel knurls that not only drive the welding rolls but keep them clean and maintain a constant cross-section throughout the life of the roll.

* * *

To the average individual the process of electric welding is limited to the making of spot and butt or flash welds. Of late years seam welding has been added, but few people have recognized the possibilities of riveting and upsetting by using the resistance process in such operations.

The lengthy strides which have been made in the development of special alloys has brought about changes that are nothing short of being revolutionary; for instance, we find many examples where it is desirable to use materials of certain analysis to insure sufficient strength where space is so limited that materials of ordinary nature cannot be used, or where some special wear-resisting material is absolutely necessary. This ofttimes introduces a condition that is difficult to overcome by ordinary means, so new methods must be employed. Since the purpose of this part of this article is to point out what may be done in the way of electric riveting and upsetting as a step toward the solution of such problems, a few recent applications will be described.

In Fig. 1 is illustrated an automobile part in which a gray iron

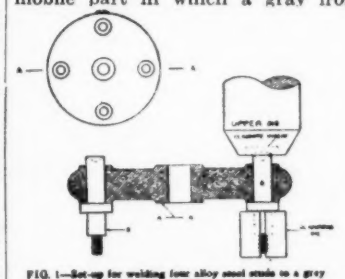


FIG. 1—Set-up for welding four alloy steel studs to a gray iron casting

casting, A, has four special alloy steel studs, B, which must be securely and firmly fastened therein. The material from which these studs are made will not permit of its being riveted cold in the ordinary manner for the reason that its hardness causes it to shatter under the repeated blows of a riveting hammer. Neither would it be practical to heat the entire stud in order that it might be riveted hot, for the reason that the heat treatment to which the part had been subjected would be entirely destroyed. After conducting a series of experiments it was found that reaming the casting to a drive fit, the stud could be pressed into the casting, leaving a short amount to project from one side.

When the stud was clamped in the holding die of a suitable electric welding machine, preferably a standard design, it was found that the protruding part of the stud could be heated to a temperature where upsetting or heading was easily accomplished. Since little or no heat traveled beyond the face of the casting, no damage was done to that part of the stud, subject to wear, when the part was finally assembled. By using an automatic welding machine, the human element was entirely eliminated, and each riveting operation was exactly alike, in so far as the same amount of time, the same amount of current, and the same amount of pressure were applied to each stud.

A 75 kilowatt automatic spot welder, with a special clamping arrangement for holding the stud on the lower arm, can be used for this operation. This outfit operates at a speed of approximately thirty strokes per minute so that not over two seconds actual time can be consumed in heating and upsetting the stud used in this production operation. The elapsed time from floor to floor on this particular part in which four studs are used will not exceed twelve or fifteen seconds at the outside. The pressure applied to the work can be varied from nothing up to 2,500 pounds. A satisfactory job is therefore assured.

Copper as a means of heading the rivets was not satisfactory and it became necessary to find some other material for this purpose. Elkonite was selected and in practice it was found that when the correct grade was used its life was many times longer than that of copper, which could not be depended upon to stand up for more than fifty or seventy-five operations before it had to be renewed. The advantage of handling an operation of the kind described are apparent even from a casual glance at the illustration, and the many difficulties which had developed in connection with it when first placed in production were speedily overcome when electric riveting was resorted to.

WELDING PROPELLER SHAFT

Figure 2 shows another operation which is really a combination of welding and riveting, the part being a propeller shaft tube made up of a malleable iron casting, A, and a

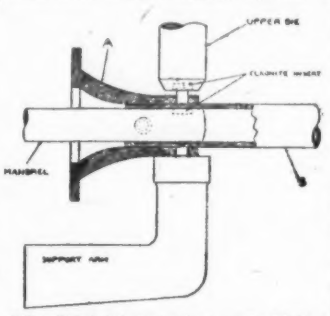


FIG. 2—Method of riveting together a propeller shaft by the use of resistance welding

piece of standard steel tubing, B. The common practice in an operation of this kind has been to drill holes for rivets through the casting and tube after the parts have been assembled. The rivets were then put through the holes with the heads on the inside of the tube. It was then necessary to insert a mandrel to hold the rivets in place, after which they were headed over with either a pneumatic hammer or under a punch press. The method now used by at least one manufacturer is quite different. The use of this method permits the casting to pass down the line of machines, where each operation is performed in its proper sequence and the holes drilled without giving a great deal of thought to keeping them in one particular place. A variation of one-half inch one way or the other in this case would make absolutely no difference at all. At some point in the assembly line the tubing is pressed into the casting and is afterwards placed under the mandrel in a standard electric welding machine, the work being supported by an arm extending from the base of the welder.

A seventy-five-k. w. machine is employed in connection with this operation also, using a special designed mandrel and support to insure easier handling of the work. Normal operating speed is thirty strokes per minute, with the same adjustments as mentioned in a preceding paragraph and the time required for this operation is also in the neighborhood of twelve to fifteen seconds from floor to floor.

A small cold rolled steel slug is dropped into the hole in the casting, which extends probably $\frac{1}{16}$ inch above it. The upper die is then brought into contact by depressing a foot treadle, which starts the welding cycle and the end of the slug is not only heated to a plastic state when it is automatically headed by the lower end of the stud, but is also welded to the steel tube itself. Tests have been made that show the comparative strength between this and the old riveting method, which proves there is an increase of approximately 25 per cent. in strength, to say nothing of saving a considerable amount of time, which the old riveting method required.

CUTTING STEEL CABLE WITH A BUTT WELDER

An electric welding machine is ordinarily thought of as an outfit for joining pieces of metal together and is seldom thought of as something with which to cut pieces apart. In the manufacture of articles where a braided or twisted steel cable is employed difficulty is experienced because of the tendency of the cable to fray out at the ends. This is entirely overcome by placing the work to be served into the clamping dies of a butt welding machine with the upsetting platen in the closed position (see Fig. 3), or in other

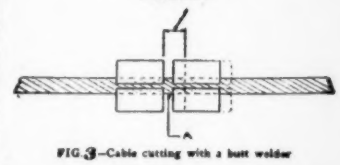


FIG. 3—Cable cutting with a butt welder

words, as it would be when a butt or flash weld was completed. With the work thus in place, current is applied when the material quickly reaches a semi-molten state, then by quickly pushing the platen back to the opening position the work is automatically severed and in the case of a cable the individual wires making up the strands are welded together so no fraying or untwisting will result. Twisted or braided cable is mentioned particularly, but it is not difficult to see where this scheme can be used to advantage in other ways.

CUMULATIVE NEW PASSENGER CAR

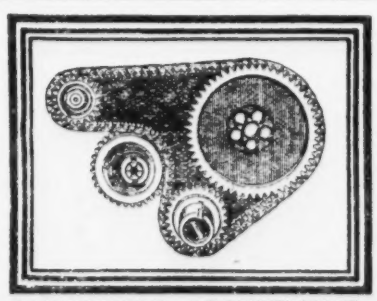
Figures in this table are from R. L. Polk & Co. of Detroit, with the exception of Illinois, which are supplied by the Robinson Advertising desiring county, city or town lists, or lists of owners in any given

Some of this data has been published previously, but it is

Returns for today:

States	Auburn	Austin	Black Hawk	Buick	Cadillac	Chevrolet	Chrysler	Cord	DeSoto	Dodge	Durant	Elcar	Erskine	Essex	Ford	Franklin	Gardner	Graham	Hudson	Hupmobile	Jordan	La Salle
Arkansas	3			20	2	611	30	1	16	67	9		6	22	1036			17	7	6		7
Delaware	9			39	6	203	14	1	5	7	16		3	21	387	4			10	6		9
Illinois	152		9	718	66	4754	445	28	419	582	157		87	563	8112	85	36	196	332	283	15	121
N. Dakota	1			18		384	13		14	19	20		9	20	458	1	1	7	14	2		
S. Ca'lina				32		394	26		12	30	3		3	29	699	2		4	12	12		4
Rh. Island	22			109	7	475	71	4	68	80	14		12	79	677	9	1	25	30	32		14
Utah	10		1	34	2	309	18	1	18	32	32		10	42	536			10	16	7		2
Wisconsin	26		1	235	11	2483	126	5	89	202	87		44	295	3349	11	6	85	150	54	4	13
Totals	223		11	1205	94	9613	743	40	641	1019	338		174	1071	15254	112	44	344	571	402	19	170
Ark., '29				51	2	740	43		25	103	25		4	52	1148			25	20	8		15
Del., '29	13			43	7	201	11			6	16		2	64	293	3		7	13	3		18
Illinois, '29	212		1	958	149	5054	554		471	837	243	43	61	1477	6699	52	18	609	531	275	19	142
N. Dak., '29				15		217	12		12	37	25		3	39	334	1		8	5	2		
S. C., '29				47	3	677	29		19	42	5		2	59	1034	3		9	34	11		2
Rh. Isl., '29	15			112	18	356	76		52	80	8		1	160	548	19		66	41	19	1	29
Utah, '29				28	2	394	20		16	67	77		3	97	544	1		34	17	8		2
Wis., '29	17			174	6	1234	69		44	180	40	5	14	380	1450	5	4	90	145	19		11
Totals, '29	257		1	1428	187	8873	814		639	1352	439	48	90	2328	12050	84	22	848	806	345	20	219

MULLINS for STAMPINGS
Quality—Service—Price
MULLINS MANUFACTURING CORP.
In the Cleveland and Pittsburgh District, Main Office and Works, Salem, Ohio.
BRANCH OFFICES:
332 S. Michigan Ave.
Chicago, Ill.
7-252 General Motors Bldg.,
Detroit, Michigan


AUTOMATIC ADJUSTMENT

TIMING CHAI

AS LONG as the car owner never hears his timi chain, never has to think about it, never has to spe money on it, he is getting timing chain satisfaction. Tha what he's after when he asks you if there is a Link-Be Chain on your make of car. He wants the front end dri

LINK-BELT COMPANY

Multiple Boring Machines Speed Work

ACCURACY ALSO GREATLY IMPROVED

New Automatic Indexing Takes Place of Expert Machinists

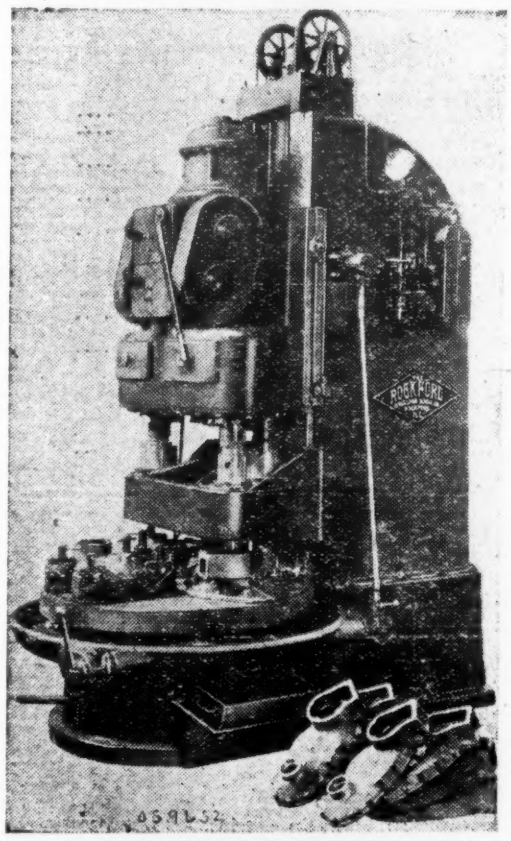
By G. L. CHRISTIANSON
Rockford Drilling Machine Co., Rockford, Ill.

ONE of the greatest and most important strides in the development of machinery for high production in the automotive field has been in the drilling and boring division.

It was not so many years back that a drilling machine was merely a device for putting some kind of a hole in a piece of metal, and there was not such a great demand for extreme accuracy or speed. If the hole was somewhere near to being true, that was enough and the time it took to do it was secondary. But the demand for better and greater production, which demand has been created by the automotive industry, has changed all that, and the manufacturers of drilling and boring equipment have kept pace with the demand.

From the crude early types of drilling and boring equipment emerged the special single purpose heavy duty high production machines of today for drilling and boring operations, and on which the automotive field depends so much today for its ability to produce in large quantities. In keeping with the demands of production for greater accuracy and speed, machines were constructed of great sturdiness and incorporated more than one spindle right in the design of the machine, these spindles being placed on proper centers required for the one particular part on which machine was to work. In this field today we have the horizontal and vertical arrangements, and combinations of vertical and horizontal, with a quantity of spindles working from two or more directions at the same time, horizontally or vertically, or both.

Through the use of indexing tables and two or more fixtures, loading and unloading time is absorbed in the time it takes machine to do the actual machining, as the operator unloads and reloads parts in the idle fixture while machine spindles are working on part in the other fixtures. Indexing the machine table brings the finished part to the unloading position, and the rough part to the working position of machine, where it is drilled or bored.



Adaptations of the indexing table feature and incorporation of proper number of spindles, permit progressive operations on various parts, such as rough boring, finish boring, counterboring, facing, etc., with all these operations being completed on one part in only the time that the longest single operation consumes, for after the machine is once started, each index of the machine table produces one completed part with all operations outlined performed. Or where more than one part can be worked on at each station of the indexing table, two or more parts can be completed at each index of the machine table.

Indexing table can be of the ordinary horizontal indexing type, with two or more stations, or the indexing drum type, with two or more sides for accommodating two or more fixtures, depending on the number of operations to be performed.

Many important improvements have also been made in the feeding mechanisms of these machines, whether accomplished wholly mechanically or by incorporating hydraulics. The latter has proved to be unusually efficient and much more flexible than the mechanical types, however.

As a result of the improved feeding mechanisms, the operator is called upon to do very little outside of load and unload the parts being worked on, and engaging the control lever of machine, after which the machine performs the operations desired more or less automatically, with one or more spindles or drive heads working simultaneously. For instance, in a great many cases after operator engages control lever the drive heads will rapidly traverse forward to predetermined points where tools are about to start working, slow down automatically to the proper feeding rate, feed through the work to a predetermined point, and when through feeding automatically rapidly return to the starting position and stop, ready for another cycle to be engaged when a new piece of work has been placed in position.

In the modern machines provisions are also made for a great variety of speeds and feeds of machine, and many combinations of operation cycles are available. When the proper combination is once secured for a particular operation, the human element is practically eliminated as far as production and accuracy of work are concerned.

Together with the progress made on the machines proper for drilling and boring operations, work holding and locating fixtures have also been highly developed which incorporate many desirable features for speed and accuracy. Many of these fixtures are designed to also guide the cutting tools, which necessitates extreme accuracy of construction for proper location of work and holding of center distances as well as diameters.

In addition to the above, the many details of construction which collectively are of great importance in any machine tool have not been overlooked, such as types of bearings, lubrication, gearing, power application and quality of material used in the machine construction to permit advantageous use of the better cutting tools available today.

The final results secured from these machines of advanced design and construction are as follows: Highest possible production with less effort on part of operators, extreme accuracy which is consistent without dependence on the human element, and troubleproof long life of equipment under continued use.

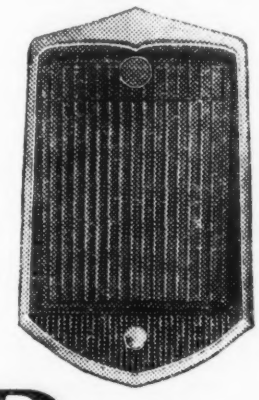
REGISTRATION TABLE, MARCH, 1930

Service, Springfield, Ill., and New Jersey, which are furnished by the New Jersey Motor List Co., New Car Division, Trenton, N. J. Readers section, may obtain these by addressing any of these three companies given here complete for the convenience of our subscribers

Arkansas, Rhode Island

States	Lincoln	Marmon	Marquette	Nash	Oakland	Oldsmobile	Packard	Peerless	Pierce-Arrow	Plymouth	Pontiac	Reo	Studebaker	Stutz	Viking	Whippet	Willys	Willys-Knight	Windsor	Miscellaneous	Totals
Arkansas	1	3	3	16	5	5	3		2	34	28	2	12			11	4	3			1,992
Delaware	2		5	14	4	18	20		3	11	27	1	7		4	3	9	1			869
Illinois	44	146	59	375	226	608	196	79	47	323	617	82	332	7	36	132	241	190	15	24	20,939
N. Dakota	1	15	4	17	9	22	1			27	37		19			26	19	8			1,186
S. Ca'lina	2	9	6	11	12	12	4			26	27	5	11			7	4				1,398
Rh. Island	1	4	10	33	20	44	26	5	14	38	90	41	30			11	43	23			2,162
Utah	4	2	2	19	5	17	6			9	31	2	19		2	4	5	3			1,210
Wisconsin	1	22	46	218	124	236	37	7	13	128	368	20	114	1	3	100	148	28		13	8,903
Totals	56	201	135	703	405	962	293	91	79	596	1225	153	544	8	45	294	473	256	15	37	38,659
Ark., '29		2		45	18	17	6			46	98	3	13			130		16		4	2,659
Del., '29	2			38	19	15	11	4	2	8	60	2	16			54		10			941
Illinois, '29	69	47		1023	377	660	322	60	22	421	1533	127	609	27		1169		216	26	139	25,252
N. Dak., '29		5		16	6	21	3			27	53	1	12			70		8		8	940
S. C., '29		4		15	19	31	7			39	121	6	9			67		3			2,297
Rh. Isl., '29	7	5		83	18	50	46	9	16	43	142	39	62			91		39	1	13	2,265
Utah, '29	2	5		32	5	16	11		1	17	67	4	32	2		62		17		3	1,586
Wis., '29	2	10		200	58	195	14	6	1	90	336	14	108	5		316		57		46	5,345
Totals, '29	82	78		1452	520	1005	420	79	42	691	2410	196	861	34		1959		366	27	213	41,285

EASIER
TO SELL
THAN EVER
BEFORE



Pines
AUTOMATIC
winterfronts

are firmly established as the best protection for ALL cars

REGARDLESS of the fact that over twenty automobile manufacturers now offer Pines Automatic Winterfronts as standard equipment on their cars, dealers still have millions of prospects—cars that are being driven without this automatic radiator protection. The judgment of the leading automotive engineers in adopting this device has made owners of *all* cars conscious of the fact that automatic radiator protection is indispensable in the efficient operation of a motor vehicle. Pines Automatic Winterfronts are easier to sell today than ever before. Let your nearest Pines distributor explain the profit possibilities in selling and servicing Pines Automatic Winterfronts—or write direct to the factory.

These cars are now equipped with Pines Automatic Winterfronts:

BLACKHAWK NASH
PIERCE-ARROW 133-143
JORDAN 8
CHRYSLER 70, 77
CHRYSLER IMPERIAL
CORD WILLYS-KNIGHT 66B
MARMON 8-79 W. and H.
DURANT 66 and 70 STUTZ
STEARNS-KNIGHT De Luxe 8-90
DODGE SR. SIX CUNNINGHAM
STUDEBAKER PRESIDENT
and COMMANDER
PEERLESS B & C ROLLS ROYCE
BUICK 40-50-60
GARDNER 130 HUPMOBILE 8
GRAHAM 621, 827, 837
CHECKER CAB BRADFIELD CAB
G. M. C. TRUCK AND OTHERS

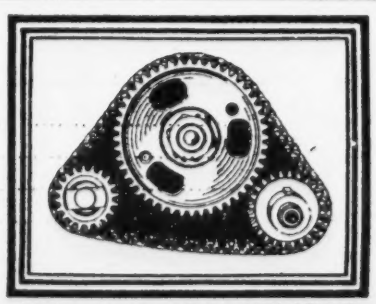
PINES
WINTERFRONT
COMPANY
1135 N. Cicero Ave., Chicago
Wholesale distributing connections everywhere. Write for name of your nearest distributor

SATISFACTION

so well done that he can forget about it. You give him what he wants when you install a Link-Belt Silent Chain, because this chain is built to the highest standards of quiet, dependable and long-lived performance by a company that is famed for its quality products.

INDIANAPOLIS DETROIT

3907-A



MANUAL ADJUSTMENT

Financial News: Range of Automotive Stocks

DURANT OF CALIFORNIA EARNS $436,730 IN 1929

San Francisco, April 18.—George Morris was named sales manager of Durant of California, at the annual stockholders' meeting, in place of R. C. Durant. Other officers and directors were re-elected.

The company reported for the calendar year net profit before division with Durant Motors, Inc., of $436,730, against $648,078 for 1928. After division with parent company net was $218,345, against $324,039. The 1929 net to common after income tax provision was $189,757, or 64½ cents a share on 294,600 shares outstanding.

Norman De Vaux, president of Durant of California, said that no action will be taken for resumption of dividends until after the midyear.

CLARK EQUIPMENT NET 1929 PROFIT $1,309,514

Chicago, April 18.—The Clark Equipment Company reports for the year ended December 31, 1929, net income of $1,309,514, after depreciation, interest and Federal taxes, equivalent, after 7 per cent. preferred dividends, to $4.92 a share on 249,824 no par shares of common stock outstanding at end of year.

For quarter ended March 31, 1930, net income was approximately $275,000, after above charges, equal after preferred dividend requirements to $1.02 a share on 249,824 common shares.

EATON AXLE AND SPRING QUARTER PROFIT $314,749

Cleveland, April 18.—The Eaton Axle and Spring Company reports for the quarter ended March 31, 1930, net profit of $314,749, after charges and Federal taxes, equivalent to $1.04 a share on 300,000 no par shares of common stock. This compares with $469,062, or $1.56 a share on common in first quarter of 1929.

NEW YORK CURB EXCHANGE

Sales		High	Low	Close	Net Chge
34400	Cities Service	41⅝	41⅛	41⅜	+ ⅜
300	do pf	93	92½	93	+ ⅛
	Con Dia Fibre		No sales		
3900	Cord Corp	15⅝	15⅛	15¼	...
	Doehler D C		No sales		
2500	Durant Motor	5⅜	5⅛	5¼	— ⅛
	Fageol Motor		No sales		
100	Fedders	11	11	11	...
	Federal Mogul		No sales		
	Federal Screw		No sales		
	Fiat		No sales		
200	Ford Canada	37	37	37	+ ½
400	Ford France	12	11¾	11¾	— ¼
3100	Ford Ltd	19½	19⅛	19½	...
	Franklin Mfg		No sales		
	Gen T & Rub		No sales		
100	Gr'n'fld T & D	17¾	17¾	17¾	— ¼
	Hall Lamp		No sales		
	Hemey		No sales		
	Hood Rubber		No sales		
	India Tire		No sales		
	Isotta Fras		No sales		
	Jaeger		No sales		
	Lakey		No sales		
	McQuay Norris		No sales		
1500	Nat Rub Mach	25⅝	23½	23½	—2½
600	Paramount Cab	8⅝	8	8⅜	— ⅛
	Perfect Circle		No sales		
	Pines Winter		No sales		
	Pitt Pl Glass		No sales		
	Rolls Royce Am		No sales		
	Ross Gear		No sales		
	Safe T Stat		No sales		
100	Seiberling	11⅛	11⅛	11⅛	— ⅜
180	Smith A O	238½	234⅜	238½	+ 2⅜
	Sparks With		No sales		
600	Stutz Motor	3⅛	3⅛	3⅛	...
1300	Thermoid Co	27⅛	26½	27	...
400	Triplex	7⅛	7⅛	7⅛	+ ⅛
300	Tung Sol	22⅛	22⅛	22⅛	+ ⅜
	U S Asbestos		No sales		
	Watson, J W		No sales		

CAMPBELL, WYANT & CANNON REPORTS $328,764 PROFIT

New York, April 18.—Report of the Campbell, Wyant & Cannon Foundry Company, including National Motor Castings Company, for the quarter ended March 31, 1930, shows consolidated net income of $328,764 after depreciation, Federal taxes, etc., equivalent to 94 cents a share on 348,000 no-par shares of stock. This compares with net income (excluding National Motor Castings Company) of $476,639 in first quarter of 1929, equal to $1.51 a share on 315,000 shares then outstanding.

NEW BUFFALO TERMINAL

Buffalo, April 18.—The Moran Transportation Company, one of the largest operators of trucks in this district, shortly will begin construction of a modern terminal building at North Division and Spring streets.

NEW YORK OVER-THE-COUNTER

Div.		Bid	Asked
6	American Hard Rubber	90	93
....	Dixon (J) Crucible	128	..
3.50	Doehler Die Casting	37½	..
7	do pf	85	..
....	Eisemann Magneto	22	..
7	do pf	95	..
....	Rolls Royce Am	..	13
....	do pf	13	17
....	Splitdorf Beth Elec	5¼	6

CHICAGO STOCK EXCHANGE

Sales		High	Low	Last
50	Acme Steel	71¼	71¼	71¼
100	Ainsworth Mfg Co	32	32	32
2200	Allied Motor Ind	17¼	17	17
100	Auburn Auto	258	258	258
1450	Bendix Aviation	52¾	52¼	52⅜
1700	Borg-Warner	47⅛	46¾	47
50	Chain Belt	48½	48¼	48¼
150	Chicago Yellow Cab	29½	29⅜	29½
5400	Cord Corp	15⅜	15¼	15½
500	Houdaille Hershey A	28½	28¼	28½
2005	do B	26¾	26¼	26½
1000	Jackson M S	14⅞	13	14⅜
3650	Modine	73	71	72½
100	Muncie Gear A	3¾	3¾	3¾
100	do B	3	3	3
250	Muskegon M S	21½	21	21
150	Nachmann Springfd	19	19	19
85	National Battery	28½	28	28½
500	Perfect Circle	43½	42½	43¼
100	Pines Winterfront	40¾	40¾	40¾
1700	Ross Gear	34	32	34
10	Wayne Pump pf	31	31	31

CLEVELAND STOCK EXCHANGE

Sales		High	Low	Last
50	Apex Electric	16	15½	16
60	do pf	96	96	96
100	Goodyear	90¼	90¼	90¼
285	India Tire	24¼	24	24¼
12	Jaeger Machine	27	27	27
100	Mohawk Rubber	11½	11½	11½
25	Packard Electric	23½	23½	23½
255	Seiberling Rubber	11½	11⅛	11⅛

DETROIT STOCK EXCHANGE

Sales		High	Low	Last
100	Alloy Steel A	12	12	12
155	do B	5	5	5
820	Bower Roller B	17⅜	17	17⅜
270	Detroit Motor Bus	6¼	6¼	6¼
200	Detroit Electric A	13	13	13
300	do B	7⅞	7⅞	7⅞
637	Excello	19¼	19	19
700	Federal Screw	40⅞	40½	40⅞
390	Federal Mot Truck	11⅞	11¾	11⅞
130	Ford of Canada	37½	37½	37½
9670	G R Metalcraft	10⅛	9⅞	10
845	Hall Lamp	14⅞	14⅜	14⅞
695	Motor Bankers	23⅞	23½	23⅞
380	MacAleer	15¼	15	15¾
300	Pittsburgh Forge	23	22¾	22¾
35	Parker Rustproof	124	124	124
768	Packard	20½	20¼	20½
100	Reo vtc	13	13	13
125	do com	13	13	13
560	Timken Det Axle	20¼	20	20⅛
300	Universal Products	26½	26½	26½
210	do B	27⅛	27⅛	27⅛

Open to Engineers and Production Men

ENGINEERS, production men and other factory executives find in the AUTOMOTIVE DAILY NEWS an open forum on all engineering and production subjects. Speedy, accurate and authentic news of essential importance to you, first appears in the AUTOMOTIVE DAILY NEWS. S. A. E. and other society news appears regularly in this paper and is considered to be one of the big features of the AUTOMOTIVE DAILY NEWS.

In addition to the specific help that engineers and production men glean from the pages of this newspaper, it also gives a vivid picture of every branch of the automotive industry, a prerequisite for all who wish to keep in step with this ever changing industry.

Subscribe for the AUTOMOTIVE DAILY NEWS and you will have your hand on the very pulse of every new engineering development in the automotive industry. Check and double check this publication's engineering news and features against any that you know. Then you'll agree with us when we state that the AUTOMOTIVE DAILY NEWS keeps you in closer touch with current developments than any other medium.

It costs but $12.00 to have this paper delivered to your office for one year. Fill out and mail coupon below NOW.

AUTOMOTIVE DAILY NEWS
Dept. 419, 1926 Broadway, New York, N. Y.

Gentlemen:
Enter my subscription at once for one year of the AUTOMOTIVE DAILY NEWS on the terms indicated below.
☐ I enclose $12.00.
☐ I will send $12.00 upon receipt of bill.

NAME.....
STREET.....
CITY.....
STATE.....

THURSDAY, APRIL 17

NEW YORK STOCK EXCHANGE

Previous 1929-1930 High	Low	Div.		Sales	High	Low	Close	Net Change
104⅞	7	....	Advance Rumely	800	20	19½	19½	....
119	15	....	do pf	600	36	35	35	— 1
223⅜	77	3	Air Reduction	4,000	142½	139⅛	142⅜	+ 2⅝
11¼	1	....	Ajax Rubber	700	2⅛	2⅛	2⅛	....
75½	35⅛	3	Allis Chalmers	5,800	65⅝	64¾	65⅝	....
55½	40⅛	....	Am. Bosch Magneto		No sales today			
101	70¼	7	Amer. Chain pf	300	100½	100⅜	100⅜	— ⅛
8⅞	2	....	Am-La France	300	2½	2½	2½	— ½
514	120	*4	Auburn	500	259¾	258	258	+ 2¾
104⅜	25	2	Bendix Aviation	5,600	52¾	52	52¼	+ ⅛
136¾	37	3	Bohn Aluminum	1,100	62½	62	62½	— ¼
86⅞	26	4	Borg-Warner	400	47⅜	46⅝	46⅞	— ⅜
63⅛	8½	....	Briggs Mfg. Co.	7,700	21½	20⅝	21½	+ ¾
43½	17⅜	2	Briggs & Stratton		No sales today			
73⅞	13	....	Brockway Motor	200	17⅞	17¾	17⅞	....
22⅞	8⅛	1	E. G. Budd Mfg.	4,500	15½	14¾	15½	....
14⅝	7¾	1	Budd Wheel	2,300	13¾	13½	13⅝	— ⅛
74	25	1.60	Bullard	8,500	69¾	68	69	— 1½
78⅜	40¼	*3	Caterpillar Tractor	1,100	77	76⅜	76½	— ⅛
90¾	18	4.20	Checker Cab	18,500	48½	45⅛	47	+ 2⅞
47½	20⅞	....	Chicago Pneu. Tool	1,100	33¼	32½	32½	— ⅝
37	20⅞	8	Chicago Yellow Cab		No sales today			
135	26	3	Chrysler Corp.	11,100	39¾	39⅛	39¾	+ ⅝
61⅜	25	3	Clark Equipment	1,500	42	39½	41⅞	+ 2⅛
62⅝	18	2	Commercial Credit	5,000	37	35⅝	36⅝	— ¼
105¾	70	6.50	do 6½s pf.	120	93	92⅞	92⅞	— ⅛
76	22½	†1.60	Comm'l Invest. Trust	1,800	47¼	46¼	46¼	— ⅛
87	84	6	do pf.	200	84¼	84¼	84¼	+ ¼
29⅜	5⅝	....	Continental Motors	1,000	7	6⅞	7	....
123¼	50	*3.50	Cutler-Hammer	300	86⅞	85¾	85¾	— ⅜
231	80	*4	Du Pont	8,400	141	139¼	140½	+ ½
76⅜	18	3	Eaton Axle & Spring	1,800	32½	32	32	— ¾
174	50	6	Electric Auto-Lite	5,300	110	108¾	110	+ ⅝
104½	55	5	Electric Stor. Battery	600	75¼	74½	75¼	+ ½
22½	3¼	....	Emerson Brant A	100	4½	4½	4½	— ⅛
73¾	15	2.50	Evans Auto Load	300	22½	22	22½	+ ¼
22⅜	5	.80	Federal Motors	100	11⅜	11⅝	11⅝	....
13¾	6	.64	Fifth Avenue Bus		No sales today			
37	24½	1.60	Firestone T. & R.	200	27	26⅝	26⅝	— ⅜
89⅜	79¾	6	do pf.		No sales today			
20⅛	2⅛	....	Fisk Rubber	1,300	4⅞	4⅜	4⅞	....
72¼	8	....	do 1st pf.	20	18½	18¼	18¼	— ¼
33⅞	5	....	Gabriel Company		No sales today			
25	3	....	Gardner Motor	500	5¾	5½	5¾	+ ¼
95⅝	55¼	1.60	General Electric	100,900	93¼	90¼	93	+ 2⅞
91⅜	33¼	*3	General Motors	61,500	51¾	50⅞	51¼	+ ¼
126½	112	7	do 7s pf.		No sales today			
64⅛	26	*2	Glidden Co.	6,500	36	34¾	35⅞	+ 1
106¼	95	7	do pf.		No sales today			
105¾	38¼	4	Goodrich	4,100	49½	48¼	48¾	— ¾
115⅛	95½	7	do pf.	200	101	101	101	— ½
154½	60	5	Goodyear T. & R.	4,500	90½	87⅜	89	— 1⅞
104⅞	86	7	do pf.	380	102	102	102	....
54	7⅜	....	Graham-Paige Motor	1,400	11	10⅝	10⅝	— ¼
68⅜	5½	....	Hayes Body	9,600	14¼	12½	14¼	+ 1⅝
33½	21¼	1.80	Hercules Motor		No sales today			
52¾	13	2	Houdaille-Hershey B	2,600	26⅝	26	26⅛	— ⅜
93½	38	5	Hudson Motor Car	3,600	53	52½	52¾	+ ¼
22	18	2	Hupp Motor Car	6,700	22	21½	21¾	— ¼
32½	3½	....	Indian Motocycle	4,100	10½	10	10½	....
14¼	2	....	Intercon. Rubber		No sales today			
142	65	2.50	Interna. Harvester	10,400	114⅞	112	113½	+ ½
145	137	7	do pf.		No sales today			
242¾	90	3	Johns-Manville	11,800	128	125½	127⅛	— 1⅞
16½	1½	....	Jordan Motor Car	900	4⅛	4	4	— ⅛
24	3	....	Kelly-Springfield	300	5¼	5¼	5¼	+ ⅛
24	3	....	do 6s pf.		No sales today			
24	3	....	do 8s pf.		No sales today			
59¾	18⅜	2	Kelsey-Hayes Wheel	1,200	37⅛	37	37	— ⅛
25	5	....	Lee Rubber & Tire	300	9⅛	9	9	— ⅛
45⅜	39	2.60	Link Belt		No sales today			
108⅞	22	2	Ludlum Steel	600	40⅜	39¼	40⅛	+ ⅛
114¾	55⅛	6	Mack Trucks	1,100	83⅝	82½	83⅝	— ⅛
89⅞	30	*2	Marlin Rockwell	200	50⅜	50¼	50¼	— ⅝
104	19	2	Marmon	1,200	28⅞	28¼	28¼	....
18	2½	....	Martin Parry		No sales today			
34⅞	9	2	Mengel	2,200	21⅜	20½	21⅜	+ ⅞
122⅞	44	2.50	Michigan Steel	100	70	70	70	....
53	37	3	Midland Steel	500	42⅞	41⅜	42	+ ¼
5⅜	3⅞	....	Miller Rubber		No sales today			
16½	1½	....	Moon Motors	10,300	11¼	9½	10	— 1½
31¾	3¼	....	Moto Meter G. & E.	700	8	7⅜	7⅞	+ ⅛
142	36	2	Motor Products	1,000	71	68	68⅞	— 2⅜
55⅛	21	3	Motor Wheel Corp.		No sales today			
81⅞	10	....	Mullins Mfg.	700	19⅜	19	19⅜	+ ⅜
100⅞	14⅞	‡2	Murray Corp.	3,400	23⅜	22½	23⅜	+ ⅞
118⅞	40	6	Nash Motors	2,900	52½	51	52	+ ⅛
41⅞	14⅝	1.50	National Acme	600	22⅞	22⅝	22⅝	— ¼
16¼	¾	....	Norwalk T. & R.	600	3⅛	2⅞	2⅞	— ⅛
25	9	....	do pf.		No sales today			
10⅞	2½	....	Omnibus Corp.	300	6⅞	6⅞	6⅞	....
55	22¼	2.50	Otis Steel	200	35⅞	35¾	35⅞	— ⅛
32¼	13	1	Packard Motor Car	27,000	20½	20⅛	20½	+ ⅜
26⅛	15½	1.50	Parmalee Transport	5,000	20¾	19½	20	— ¼
22½	5⅛	....	Peerless Motor Car	800	9	8½	8⅞	— ⅝
37⅝	18	....	Pierce-Arrow		No sales today			
87½	67¾	6	do pf.		No sales today			
30¾	20	1.50	Pure Oil	1,400	25¾	25½	25¾	+ ⅛
58½	28	2.60	Raybestos Manhattan	56,500	58⅞	55½	58½	+ 2½
31⅞	10⅛	.80	Reo Motors	1,000	13⅛	13	13⅛	....
12¼	3⅝	....	Reynolds Spring	300	5⅜	5⅜	5⅜	+ ⅛
22½	9¾	1.20	Seagrave	1,600	11⅞	10¼	10⅝	— 1⅜
31¾	19	1.40	Shell Union Oil	900	24⅛	23¾	24	+ ¼
45	21	2	Sinclair Oil	9,700	30	29¾	29⅞	....
73	13⅛	1	Sparks-Withington	1,500	29¼	28½	28⅝	....
66¾	20⅛	....	Spicer Mfg. Co.	2,500	29⅝	28	29⅝	— ¼
55⅞	38	3	do pf.		No sales today			
81⅞	51½	2.50	Stand. Oil of Cal.	3,900	70¾	70⅛	70¼	— ⅜
83	48	*1	Stand. Oil of N. J.	37,500	78½	77½	78½	+ ½
48½	31¼	1.60	Stand. Oil of N. Y.	6,500	36⅜	35⅝	36⅜	+ ¼
77	30	*3.50	Stewart-Warner Spd.	600	42⅞	42⅝	42¾	— ¼
98	38¼	5	Studebaker Co.	1,200	41	40⅞	40⅞	— ⅛
98	38¼	5	do pf.		No sales today			
39¼	33½	2.40	Thompson Products	900	37⅝	36½	37½	+ ½
34⅜	11½	.80	Timken Detroit Axle	600	20	19¾	19¾	— ¼
139⅜	58½	3	Timken Roller Bear.	3,400	87	85¼	87	+ 1½
63	30	2.50	Trico	1,000	39½	39⅛	39⅛	— ⅝
243⅝	88¼	*6	U. S. Ind. Alcohol	9,400	93½	88½	90½	+ 1½
65	15	....	U. S. Rubber	5,200	33½	33	33½	+ ½
92⅛	40⅛	....	do 1st pf.	600	61⅛	59¼	59¼	— 2
42⅞	15	1	Warner Quinlan	6,600	22½	21½	22¼	....
67¾	36½	2	Westinghouse A. B.	1,900	47⅜	46⅛	46¼	— ⅛
53⅛	27¼	2	White Motors	600	41	40⅜	41	+ ½
61¼	19	2.50	Wilcox Rich A	100	31	31	31	+ ⅞
62	12⅜	2	do B	2,100	25¾	25⅛	25⅝	— ⅛
35	5¼	....	Willys-Overland	5,300	9	8⅝	9	+ ⅛
103	65	7	do pf.	300	80¼	76	80	....
88	61¾	....	Yale & Towne		No sales today			
51¼	7½	....	Yellow Tr. and C. B	22,600	28⅜	27⅛	28¼	+ ⅜
59¾	33⅛	3	Young (L.A.) Spr. & W.	200	42⅜	42¼	42¼	— ⅛

*And extra. †And 6 per cent. in stock. ‡And stock.

ENGINEERS STATE VIEWS ON BASIC DESIGN TRENDS

(Continued from Page 11)

ably smarter and has a greater appeal to the public if it is low.

We believe that motors will be built still more powerful, especially at high speeds.

We do not feel that oil cooling devices are necessary if connecting rod bearing pressures are kept low by the use of aluminum connecting rods. Aluminum connecting rods are expensive, but bring about other advantages that cannot be obtained by the use of oil cooling systems.

We believe that a rubber universal joint will be designed that will eliminate all problems of this important assembly. We do not refer to the rubber fabric disk joint which has been in public use in the past.

"INCREASED SMOOTHNESS"
By DELMAR G. ROOS,
Chief Engineer, Studebaker

I believe that, in general, compressions will go higher. This is particularly true if by concerted action of the Engineering Society and the American Petroleum Institute a standard specification for motor fuel can be developed and made legal by act of Congress, or by act of several state legislatures; this fuel to be of sufficiently good grade to permit of slightly higher compression ratios. Even if this is not done, there is a steady move toward higher compressins and the use of anti-knock fuels. The consequent roughness which develops in a motor is more or less being offset by the use of more cylinders or rubber insulation.

Will four speeds gain ground? I, personally, do not think so. I think the whole four speed movement was a false issue and that it has created distinct drawbacks in the handling of cars so equipped in very hilly territory. What it has done is forced the better development of three speed gear boxes. I think this year that we will see a very vast improvement in gear shiftings as used in the three speed gear box by at least two of the largest manufacturers in the business, and, with this disappears any necessity of four speeds. Needless to say, the three speed gear box in any form is less expensive and can be made quieter.

Of course, it is possible to build cars lower, and even the present conventional chassis. I do not believe, however, that the top sills of the door should be made any lower than between 63 to 64 inches, because when cars are built lower than this it is very difficult to get into them. What I do think is that the frame line and floor of the cars can be lowered, thereby restoring considerable headroom, and, incidentally, lowering the center of gravity of the car somewhat. There seems to be a mistake in the impression that cars cannot be built lower than they now are with the conventional chassis. This impression is erroneous. They can, but, when you do build them low, you get into trouble. In at least three instances in the last two years manufacturers have had to increase the height of their cars after they went into production.

I believe there will be a gradual trend toward higher horse power, although for the present I think horse power can be forgotten as an issue, because almost any car that is built, from the cheapest to the most high price, is a good deal faster and more powerful than either the ability of the drivers who handle them justifies, or traffic conditions and highway conditions will permit them to be safely driven.

As yet, we have not found that oil-cooling devices are necessary for any of the jobs which we have built. Even under the most extreme conditions the continued open throttle worked. Such a device apparently has been necessary in marine engine practice, but none of our measurements indicate dangerous oil temperatures in our engines with an exposed oil pan such as we and most other manufacturers use.

Unquestionably, the development of the use of rubber in various parts of the cars for insulation and absorbing vibration will continue.

In general, if there is any definite, absolutely certain trend in automobile engineering in the next few years, it is going to be covered by the one phrase—"increased smoothness." I believe that this is the most important direction in which any automobile manufacturer can move. It is of more importance than performance, than extreme horsepower or speed, or any trick designs, because it is the thing which will sell cars instantly to a customer.

MARMON

THE INDUSTRY'S MOST EXPERIENCED BUILDER OF STRAIGHT-EIGHTS

Cook County (Chicago) Registrations for the first quarter of 1930 show Marmon with the largest increase in number of units, except Ford—and the largest percentage of gain of any make

1930 IS AN EIGHT-CYLINDER YEAR —AND MARMON HAS THE EIGHTS

Marmon's conspicuous success for the first quarter of 1930 is no accident. Neither is it limited to any one city or section. January set new records straight across the country. So did February. So did March. Marmon's remarkable record in Chicago has counterparts in Philadelphia, Cleveland, Pittsburgh, Omaha, Portland, Maine, and the rest. In North Dakota, to cite another specific case, Marmon during the first quarter showed a gain of 245 per cent. over the corresponding period last year. All but two other competitive makes showed losses. With the entire country definitely going straight-eight Marmon, with the only complete line of straight-eights in the world, is getting the call in the fields from $1000 up. Write for details of the Marmon 1930 All-Eight Franchise. MARMON MOTOR CAR COMPANY, INDIANAPOLIS.

FOUR GREAT STRAIGHT-EIGHTS IN FOUR GREAT PRICE FIELDS			
$1000 FIELD	$1500 FIELD	$2000 FIELD	$3000 FIELD
New Marmon Roosevelt	New Marmon Eight-69	New Marmon Eight-79	New Marmon Big 8

Conveyor Systems for Plants Developed

FINAL ASSEMBLY NOT ONLY USE

Greatest Advance Was Overhead Trolley Conveyor

By N. H. PREBLE
Vice-President, Chemical Engineer Mechanical Handling Systems, Inc., Detroit, Mich.

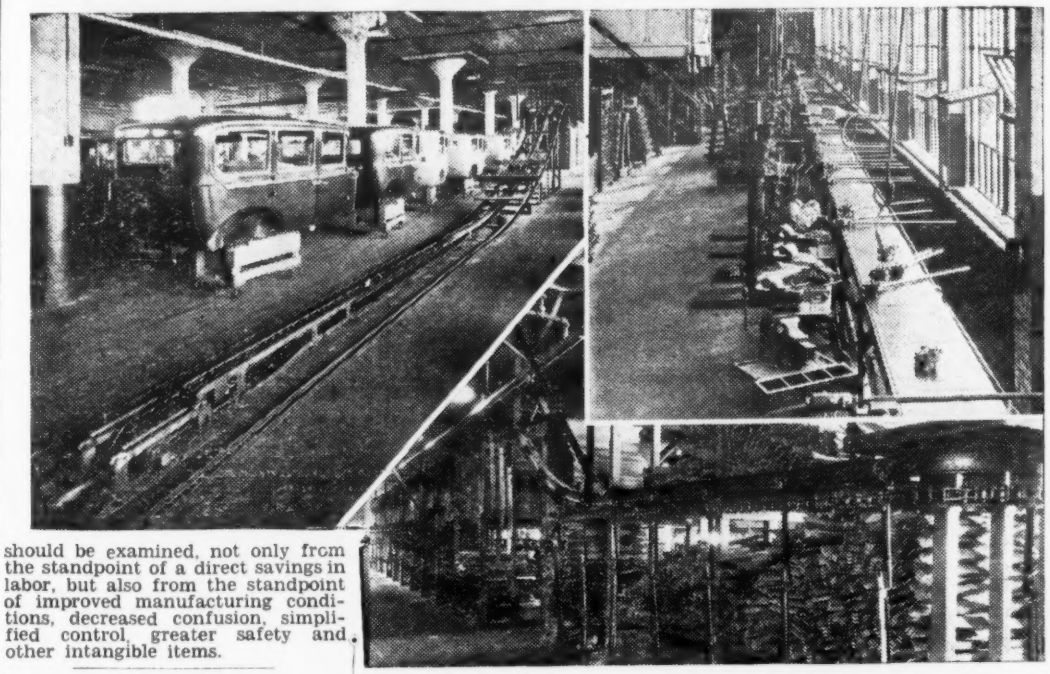
PROBABLY no other one mechanical development has done more to make possible the present-day automobile production than the conveyor. Quantity production at low cost and with low inventories would be impossible without it. Also, without it the floor space per car produced would have to be very materially increased, probably more than doubled. And yet, the conveyor is, in general, very little understood by the public, and, outside of the automotive industry, its possibilities and application are not generally understood by production executives.

The general public thinks of the conveyor in the automobile industry in terms only of final assembly. It does not appreciate that this is only one of many applications of conveyors to automobile production. The production man in other lines thinks of the conveyor usually in terms only of labor-saving. He does not appreciate the enormous saving in work in process, in finished, semi-finished and raw inventories which it makes possible. He also does not fully understand what can be done in the way of production control through the automatic mechanical pace-making of the conveyor.

Probably the first application of the conveyor to automobile production was on the final assembly line. But it has since been applied to other functions, such as the transportation of finished and semi-finished parts to the assembly line, the handling of parts from one department to another, the assembling of various units, such as motor, transmission and axle, the handling of sheet metal parts and bodies through painting and finishing operations, and in the machine shop the handling of separate pieces from one machine to the next. These various functions can be generally divided under three headings: Transportation, processing and assembly, and it is sometimes hard to say which one of these three functions is most important. They are all interdependent, for a final assembly conveyor is not complete in itself, it must be served by transportation conveyors bringing stock to the line.

Probably the greatest single advance in conveyor design in the last few years has been the development and application of the overhead trolley conveyor, serving primarily as a transportation medium. Located up near the roof trusses, it leaves all floors and aisles clear, but can be brought down to lower levels for loading and unloading. It is used as a medium for handling parts through painting and drying operations. It is extensively employed for bringing in incoming raw material, such as castings, forgings and incoming semi-finished or finished parts from the receiving dock direct to the assembly line, to storage or to the machine shop. Its application is endless and it handles practically any part from the smaller items, weighing less than a pound, to large units, such as motors, axles and frames. It can be turned in any direction, can be run from one floor to another, and, by means of covered bridges, from one building to another. It is relatively inexpensive, and when the plant is rearranged or department changed, it can be taken down and put up again in some other location and in a new plan. In some cases it may be automatically loaded and unloaded and will serve, in addition to transportation, as a storage bank, obviating the necessity of store rooms or storage racks near the assembly line.

In these days of close attention to costs, production executives are examining even more carefully than before their plant layout and their handling methods. No plant would consider for a moment doing without a final assembly conveyor. But there are many other places where installations of other types of conveyor equipment may be made, and made on a basis on which will pay large dividends. Such opportunities should be examined, not only from the standpoint of a direct savings in labor, but also from the standpoint of improved manufacturing conditions, decreased confusion, simplified control, greater safety and other intangible items.



DIAMOND TOOL USE DESCRIBED

Automotive Machine Co. Tells of Success Of Coulter Idea

By HENRY A. GAMELIN
The Automotive Machine Company
Bridgeport, Conn.

THE black (carbon) and brown (bortz) diamonds, like Kipling's "Colonel's Lady and Judy O'Grady," are sisters under the skin to the beautiful and much cherished blue-white gem stones with which the name diamond is most commonly associated. While these colored members are never seen in the best of society, they have attained and hold a very prominent position in the high-speed production schedules of modern industry.

Their use as cutting tools is most interesting to industries where non-ferrous metals form the whole or component parts of products manufactured.

Diamonds properly mounted and correctly lapped to shape will, with careful and positive adjustment, maintain absolute adherence to working limits of a fraction of one-thousandth part of an inch, giving invariable accuracy and uniformity to work done.

Due to the physical characteristics of diamonds, their use is impractical in mechanisms that are subject to vibration in the spindles or work heads. Vibration destroys their cutting accuracy, slows up cutting speed and shortens the useful life of diamonds.

Many difficulties were met in the design of a machine that would give practical results, and at the same time meet with the rigid requirements of modern production, as to speed and quality of finished work.

In 1925, James Coulter, vice-president and chief engineer of the Automatic Machine Company of Bridgeport, Conn., designed and patented the first practical vertical boring machine for using diamonds as cutting tools. This machine is known, as the Coulter diamond tool boring machine and is manufactured by his company and extensively used in the automotive and aircraft as well as many other industries. In working out this design, Mr. Coulter was influenced by the peculiarities of the diamond in arriving at the basic principles involved on which the present Coulter diamond tool boring machine is built.

The extraordinary success of this machine in practical application is largely due to the fact that it was designed around the tool and its peculiarities, whereas the reverse is the usual procedure.

Coulter diamond tool boring machines are used for boring either or both ends of automotive and aircraft engine connecting rods, wrist pin holes in pistons, bearing bushings in electric motors, component parts of electric refrigerators, pump bodies, flush toilet valves, aeroplane engine starter housings, aircraft and automotive valve stem guides and a variety of bearings and bushings in brass, bronze, babbitt, aluminum and alloys.

The diagrams illustrate two average diamond tools and the table gives what has been determined by practical application and research to be the correct shaping of diamonds for the given size holes to be bored. Body of the tool, as used in Coulter diamond tool boring machines, is of steel and the diamond is set into the end with enough metal surrounding it to hold it permanently rigid.

Diamond tools, when carefully handled, have an extremely long life and require only infrequent relappings between long runs of production work. The cost of relapping is usually insignificant compared to the more frequent grinds necessary with metal tools.

Thus, the tool cost per unit, where diamonds are used, is appreciably reduced and production is less frequently interrupted for resharpening or replacement of tools which, in turn, means larger amounts of finished work per hour, per man, per machine.

The accuracy and uniformity with which properly made diamond tools will operate eliminate in many instances preliminary or subsequent operations, such as broaching, reaming, scraping and fitting and the necessity of trial assembly. In actual practice it has been proven that the diamond works with such fidelity to production demands that marked savings are effected in original assembly and replacement of diamond bored parts is easy and economical.

In using diamond tools it is equally important that the design of the machine be correct and that the work-holding fixture be consistent with the accuracy of the machine design, as any discrepancies between the two will offset advantages obtainable from the use of a tool of such close working accuracy.

The varying degrees of hardness and differences of composition in the aluminum alloys now used have no deterring effect on the efficiency with which properly selected diamond tools will operate. Diamonds will work at high-production speed, effecting profitable savings of machining time, handling and inspection expense.

GRINDING MACHINES WIN ATTENTION OF PRODUCTION MEN

By J. Y. SCOTT, Sales Manager
Van Norman Machine Tool Co., Springfield, Mass.

PROBABLY no particular field in the machine tool industry has been so active in the way of developing its products to a hitherto unknown degree of mechanical operation as has that of the grinding machine group.

Part of this development can be traced directly to the constant efforts of the grinding wheel manufacturers to improve their product through the development of many types of bonding and abrasive materials, but the greatest progress has been made in the development of grinding machines whereby the operator is merely used to load the machine and the machine itself completes a mechanical cycle which produces the finished part, thereby reducing the necessity of highly skilled operators in order to secure the highest quality workmanship.

In this field the further use of the centerless grinding method in the production of odd shaped parts as used throughout the automotive and kindred industries, appears to be the outstanding feature. The use of lapping machinery for the final finishing of automotive parts, completely automatic machines for bore grinding, facing and special types of polishing, also have been developed to a very fine degree of precision.

This company has recently placed on the market a new type of plunge cut grinder for the grinding of shoulders and diameters of round pieces similar to inner bearing cones, ballbearing cones, steering gear worms, and the like. This machine, having a powerful motor drive, enables the work to be ground to complete size with but one movement of the wheel into the work. This method of grinding has produced revolutionary results in several plants where formerly special automatic machinery has been required for this work.

NEW STYLE TOOL IN STEEL CUTTING

National Acme Tells Of Improvements In Machines

By O. F. BARTLETT
The National Acme Company, Cleveland, O.

WITH the advent of alloy steels for use in automotive parts it soon became apparent that automatic screw machines must be redesigned at certain points. Accurate production at high speeds, was difficult to maintain because of the extreme hardness of the new metals.

To meet this condition at least one automatic screw machine manufacturer has designed a machine which, by increased weight and rigidity at strategic points, allows the use of the new style cutting tools necessary in working alloy steels. All lever connections have been eliminated, the cross slides being operated independently by small drums located directly under and in the center of each slide. This method eliminates all vibration, give and inaccuracy.

Exceptionally large pans are provided under the machines to allow for increased cooling system so that maximum speeds can be maintained at all times. It is no longer necessary to stop the machines to remove chips or finished work, recesses in the pan being provided at the sides and end for this purpose.

To insure permanent and accurate alignment of the cutting tools with the work spindles, the main tool slide stem and the spindle carrier are integral. This assembly is supported by three large bearings, two in the spindle carrier itself and the other at the extreme opposite end in the frame of the machine.

Recent improvements in heavy duty four-spindle Gridley automatics include air-operated chucks, operated by compound acting air cylinders, designed to insure positive holding of the chuck. These same air cylinders can be used with collets or adapters suitable for different classes of work. This type of automatic has found great favor in the automotive industry.

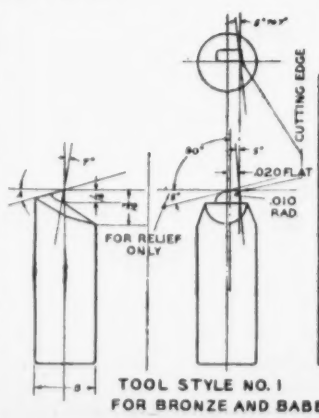
For more complicated work requiring faster production the five-spindle bar machines, taking work from $\frac{1}{8}$ inch to $3\frac{1}{8}$ inches, with the same general features as outlined above, are in great demand. This same machine will take work up to 6 inches for chucking operations.

The demand for greater reliability and longer life in automatic screw machines has made a more rigid inspection necessary in the construction of the machines themselves. Improvements in design are constantly made, but cars must be taken to make the changes gradually, so that the new accessories will fit both the advanced and old style machines.

Interchangeability of accessories on machines, made possible by arrangement among manufacturers, is a material step forward toward a reduction in overhead and production expense.

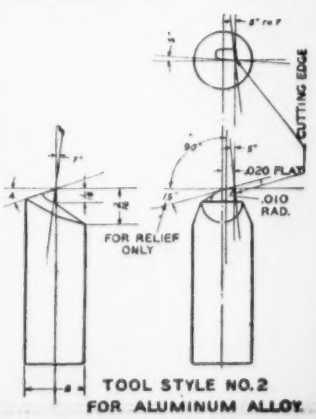
CORTLAND GRINDING WHEELS AGAIN ON FULL SCHEDULE

Springfield, Mass., April 18.—The Cortland Grinding Wheels Corporation at Chester has returned to its former full-time schedule for all employees. Vice-President Archie D. Robinson expects conditions to warrant this improvement being permanent.



HOLE DIA.	ANGLE (A)	DIA. (B)
3/8 TO 1/2	22°	3/16
1/2 TO 5/8	22°	1/4
5/8 TO 3/4	20°	5/16
3/4 TO 7/8	18°	5/16
7/8 TO 1	18°	5/16
1 TO 1 1/8	18°	5/16
1 1/8 TO 1 1/4	16°	5/16
1 1/4 TO 1 3/8	14°	5/16
1 3/8 TO 1 1/2	14°	5/16
1 1/2	12°	5/16

TOOL STYLE NO. 1
FOR BRONZE AND BABBIT.



TOOL STYLE NO. 2
FOR ALUMINUM ALLOY.

Concentrate on Cook!

Cook County in the first quarter of 1930 registered 22,283 new automobiles. The 67 other counties of northern and central Illinois registered 19,656 new cars.

Cook County alone bought 13.4% more new cars than 67 other Illinois counties combined!

Obviously Cook County is worthy of special and concentrated merchandising effort. *And over 90% of the Chicago Evening American's circulation* (569,167 daily average for the six months ending March 31, 1930) *is concentrated in Cook County.*

CHICAGO EVENING AMERICAN

a good newspaper

▼

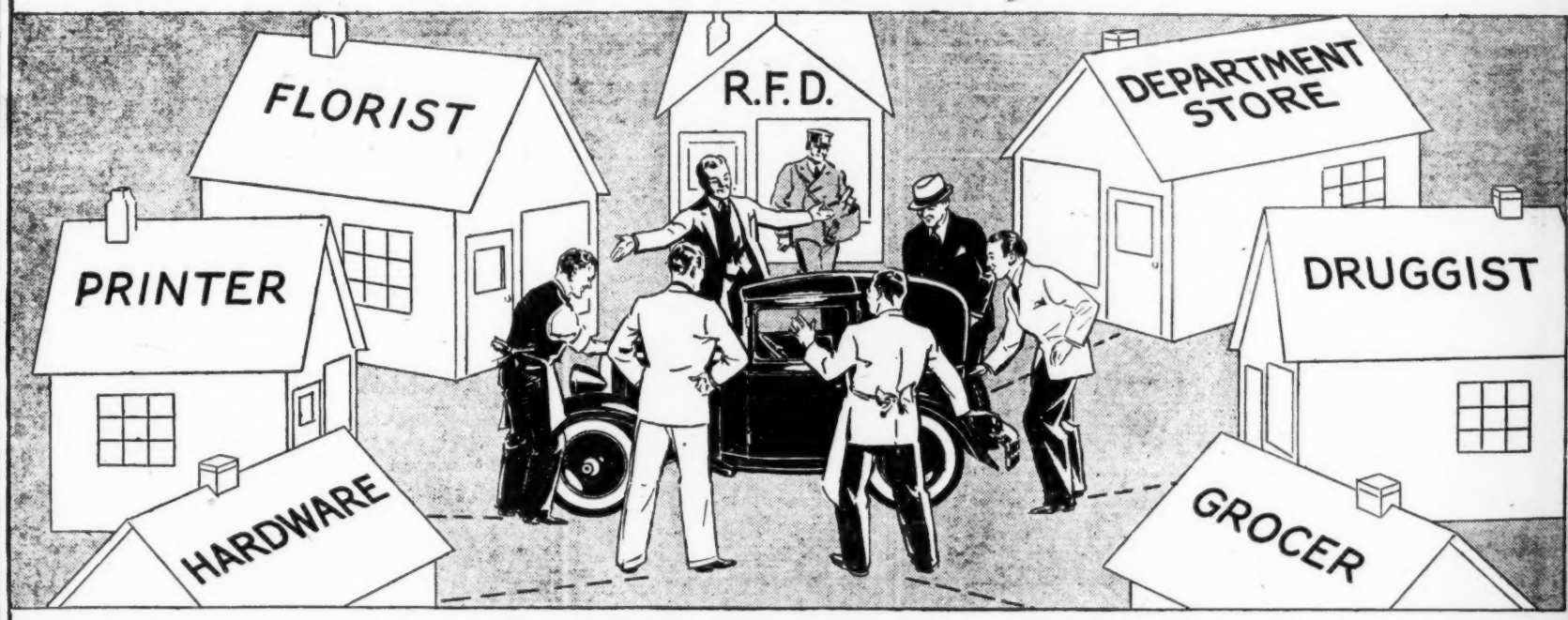
Now in its NINTH YEAR of Circulation Leadership in Chicago's evening field.

▼

National Representatives: RODNEY E. BOONE ORGANIZATION

AMERICAN AUSTIN

the bantam–car . . . that will



. . . . provide lowest cost delivery for local merchants

Add this to your list of Austin possibilities—a smart Special Delivery model, listing at less than $450, that delivers the goods for a mere ¾ of a cent per mile for gas, oil, and tires. Ask any local merchant what such a car would do to his delivery costs.

Automobile delivery means a lot to the local merchant. It widens his market, gets him more orders, increases his prestige, and gives him a strong weapon against competition.

His only objection is the cost. Merchants that have delivery service are constantly trying to reduce its cost. Those that haven't give cost as the reason. Judge for yourself the effect that Austin economy will have on both classes.

The delivery model will be a smart looking car similar to the coupe with a single seat for the driver and twenty-eight cubic feet of package space right at his elbow. It does forty miles on a gallon of gasoline, a thousand on a two-quart filling of oil and twenty to forty thousand on a set of tires.

Its small size means convenience in crowded business districts and store alleys — its speed means quick time to outlying districts. Its reliability, an important point, is attested by eight years of prize winning performance in all parts of the world.

Many a local merchant will use this model to drive to work and back as well. It has interesting sales possibilities.

Contracts for over 115,000 American Austins have been accepted. Write us for information.

IT WILL RUN 1,000 MILES ON

$5.60 WORTH OF GAS AND OIL

AMERICAN AUSTIN CAR CO., INC., 7300 WOODWARD AVENUE, DETROIT, MICH.

THE AMERICAN *Austin*